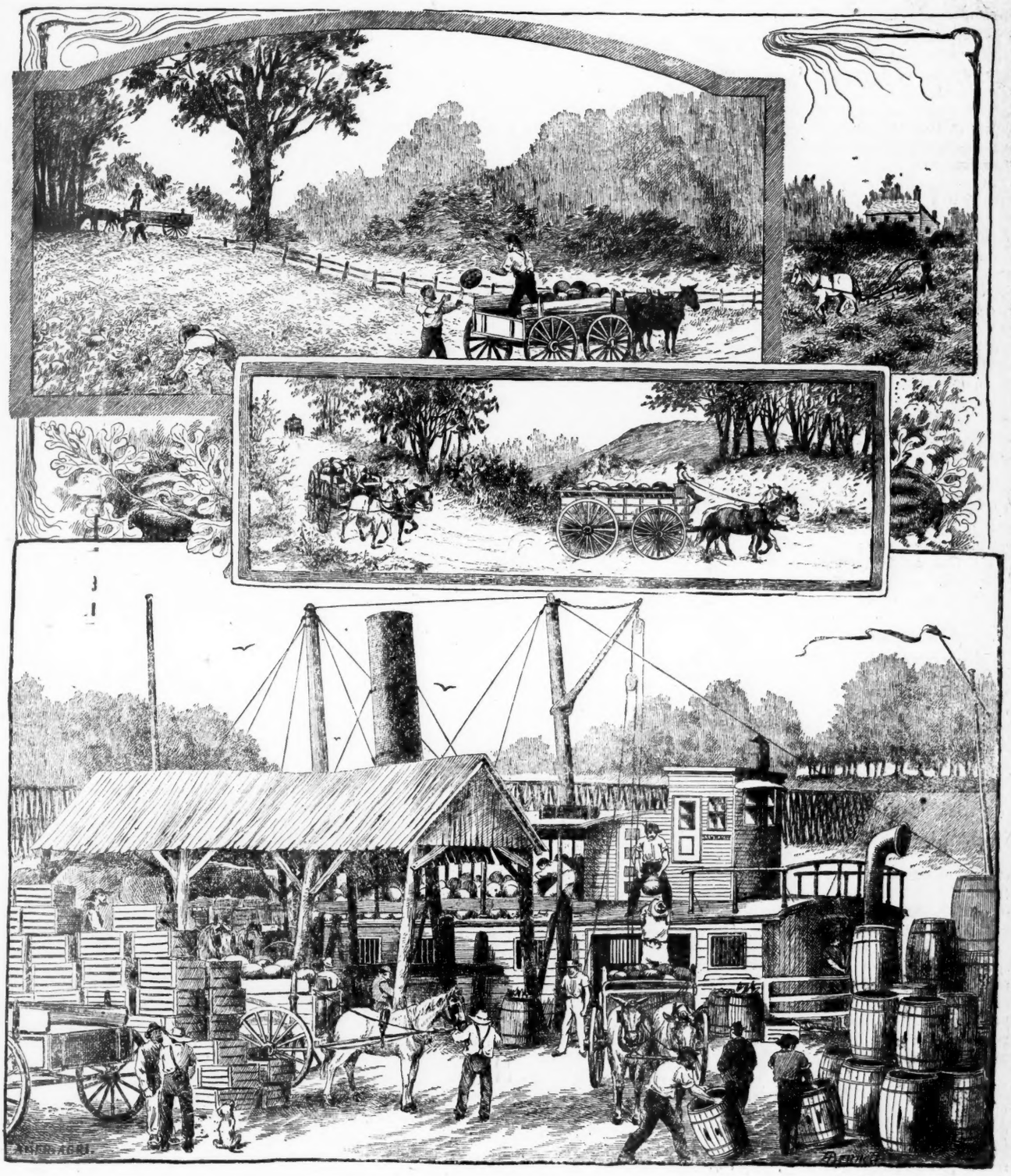
AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

VOLUME XLIX.—No. 9. NEW YORK, SEPTEMBER, 1890. NEW SERIES—No. 524.



THE WATERMELON FROM FIELD TO MARKET.

COPYRIGHT, 1890, BY THE ORANGE JUDD CO.

ENTERED AT THE NEW YORK POST-OFFICE AS MAIL MATTER OF THE SECOND CLASS.

THE WATERMELON INDUSTRY.

WATERMELON culture, from an insignificant beginning, has gradually developed into an industry of vast dimensions and importance throughout the Middle and Southern States. While in former years the market season of this fruit in our large Northern cities lasted but a few weeks, it continues now from May till severe frosts kill all tender vegetation. From Florida to New Jersey, and from Louisiana to Illinois many thousands of acres are annually devoted to its cultivation, and where soil and other conditions are favorable for its best development there is no more profitable crop grown on the truck farm. Of first importance however, are proper transportation facilities, without which it is a hopeless task to attempt to grow watermelons for profit. This fruit is so large and heavy that it has to be shipped in bulk, and with as little handling as possible. Communication by water is therefore greatly to be preferred, except with the crops grown farthest South, and coming earliest into market. Quick transportation is the principal factor in success in the latter case.

A light, dry, sandy soil, recently cleared, is best adapted to watermelon culture. After the ground has been plowed and harrowed it is furrowed both ways, ten feet apart, usually. The crossings of the furrows are then enlarged, and two heaping shovelfuls of decomposed stable manure dug in and well mixed with the soil, raising it two or three inches, so as to form a flat hill. Unless the land is in good heart, a liberal surface application of a good complete, or special fertilizer harrowed in pays abundantly for its cost. From six to ten seeds are planted in the middle of each hill, covered from one to two inches deep, and firmly pressed down. As melon seed will not sprout in a temperature below sixty degrees nothing is gained by planting it before the ground is thoroughly warmed. To insure complete success some growers make a second planting, in the same hills, a week later. As soon as the plants are well up cultivation must begin, by stirring the tops of the hills, and gradually thinning out the plants so that finally only the two strongest ones in each hill are left for bearing fruit. The subsequent cultivation consists in frequent plowing and scarifying so as to keep the surface mellow and free from weeds during the entire season. During all this time the vines should be handled as little as possible.

The picking of the crop marks a critical period, and to recognize by its general appearance the exact time when a melon is fit for marketing requires considerable experience. The various stages in the cultivating, gathering, and marketing of watermelons are vividly portrayed in our frontispiece engraving, the lower half of which represents the lively scenes and motley crowd which may be seen at the Matawan dock, in Monmouth county, New Jersey, shortly before the departure of the market boat for New York any evening during the melon season.

FALL PLOWING FOR OATS AND BARLEY.

JOSEPH HARRIS.

Much has been written in favor of fall plowing in the AMERICAN AGRICULTURIST, but I learn by letters received from readers that there are points not yet clearly understood. In repeatedly advocating fall plowing, what was particularly in mind was not sod land, but land on which a crop of corn, or potatoes, or beans, or roots had been grown, and which was intended for oats or barley in the spring. Little or nothing was said about plowing sod land in the fall; on my own farm—of late years, at any rate—I seldom, if ever, plow sod land in the fall, and that not from theoretical reasons only, but because there is not time and because, further, sod land can be plowed in the spring at times when other land is too wet and sticky to work to advantage.

It is of great importance to sow barley and oats early in the spring. A few days difference in the time of sowing often makes all the difference between a good crop and a poor one—and what a difference that is all experienced farmers know. It is not merely the loss of all profit from our labors, but the land is foul with weeds and in poor condition generally. My own land varies considerably in character. Much of it is rolling land, the knolls being sandy, while the lower edges of the knolls are more or less clayey, and the valleys between the knolls vary from a dark sand to a sandy loam and a clayey loam. Perhaps these terms do not convey a distinct meaning. All I wish to show is that the soil varies considerably and requires different methods of working. To get part of a field into good condition for oats or barley in the spring requires three or four times the labor required on other parts.

On such land as this (say a field that has been in corn the past season, and on which one intends to sow oats in the spring) I find an immense advantage from fall plowing. As soon as the corn is cut, and while it is standing in stooks in the field, if I have time I like to start the plows on the land between the rows of stooks, and finish plowing after the corn and stalks are removed.

On strong land I put three horses on the plow and turn up a good, deep furrow, and leave the subsoil on top, where it is exposed to the ameliorating action of the air and frosts of winter.

Such fall-plowed land is cleaner and much more easily prepared for spring crops than if it had not been plowed. In plowing for corn, my practice is to plow around the field, and thus avoid having dead furrows. But, in plowing in the fall for spring crops, I can, if necessary, make narrow lands, and, by connecting the dead furrows with the necessary outlets, I can get rid of a large quantity of water in the early spring. These narrow lands, by running a gang-plow so as to fill up the dead furrows, are easily leveled down, and, by cross-harrowing with an Acme or other harrow, the land can soon be got ready for the drill. I drill in 150 to 200 pounds of superphosphates with the barley and oats, and have reason to expect a good crop, and the land, after the oats or barley is harvested, is in better condition for plowing for wheat than if it had not been well and deeply plowed the fall previous.

IMMEDIATE EFFECTS OF CROSS-POLLINATION UPON FRUITS.

PROF. J. L. BUDD, IOWA.

I was glad to see the illustrated article on the above topic in the July issue of the AMERICAN AGRICULTURIST. In connection I wish to give some marked cases coming under my personal observation. At the meeting of the American Horticultural Society, at Riverside, Cal., in the winter of 1888, were exhibited many specimens of oranges and lemons that appeared to be crosses of well-known varieties. After the meeting a large grower of citrus fruits invited me to take a long tramp to note the conditions under which these abnormal specimens were found. He first took me to the boundary line between large plantations of Navel and St. Michael. "Now," said he "do not take my word for it but look for yourself for traces of the Navel on the St. Michael, and of the thin-skinned St. Michael on the rough-skinned Navel." In passing about sixty rods to and fro on the division line we literally found over one hundred specimens modified as positively as those on Page 369. We then passed through the center of each plantation and failed to find a single modified specimen. We next passed through the boundary line between plantations of Navel and Malta Blood, finding everywhere dozens of crosses between these widely varying sorts. But again we found not a specimen thirty rods away from the point where the branches of the two kinds nearly intermingled. He next took me to the boundary line between a block of Navel and Mediterranean Sweet, with the same result. Later, in talking with orange growers, dealers, and packers, I failed to find a man or woman who doubted that the pollen of such prepotent varieties as the Navel would modify the fruit of less positive sorts such as I have named, and my personal observation confirmed this after walking fully forty miles at different times with a view to looking up the subject.

In the summers of 1886 and 1887 we pollinated the blossoms of the Soulard Crab with pollen of the Roman Stem. The Soulard is merely a variety of the Native Crab (*Pyrus coronaria*), and in shape, markings, and skin, it varies as much from the Roman Stem as does the Mandarin orange from the Navel, yet some of the modified Crabs were so like Roman Stem in external shape and markings that when mixed it was not easy to separate them. That it was a true hybrid, and a violent one at that, is shown by the fact that we have not as yet germinated a single seed from the hybrid modified in shape and markings.

A number of years ago I put out one hundred plants of the Colfax strawberry, twenty feet apart, in a long row in a corn field. Near each Colfax plant—which I believe to be a purely pistillate variety—was planted a single staminate plant of wild strawberry, Wilson, Downer, Kentucky, Washington, and some other sorts at hand at the time. The main purpose was to compare the fruit pollinated by our common wild strawberry of the West with that fertilized by the large garden sorts. The result many Western fruit-growers will verify. The Colfax plants fertilized by the wild

sorts gave small, bright red berries with the positive wild smell and flavor. Those pollinated by Wilson were nearly double the ordinary size of the Colfax, with the acidity and color of the Wilson but mainly with shape of the Colfax. Those fertilized by Downer were lighter in color, rounder, and much sweeter than either Colfax, or Colfax fertilized by Wilson. I have not since seen such marked variations, but mainly I think for the reason that our garden sorts of to-day are too closely related. I fruited for a number of years a row of Jonathan apple with a row of Whitney Russet interlocking branches on the west. Very many have picked dozens of russeted Jonathans from this row when not one could be found on other rows of this variety. While many other less marked cases could be given they all unite in favoring the belief that the pollen of fixed types used on what friend Gideon calls "mongrels" gives these abnormal specimens most frequently. This is true even in our corn fields. As an instance, I found when I came here thirteen years ago that the seed corn was not in condition for germination. After much searching I found several bushels of the flesh-colored corn known as "Butcher" which had been dried by fire heat. Fifty acres of this were planted with the result that it placed a sprinkling of red grains in all the white and yellow varieties within one hundred rods in the direction of the prevailing winds when in blossom. This modifying influence of the red corn I have noticed in all neighborhoods where it grows, and it is well known that it is an ancient fixed type found among the primitive Indian tribes of the Southwest.

CLEANING OUT SMALL STREAMS.

All natural water courses run through the lowest land; and yet it is often true that the banks of streams are higher than much of the land lying at a little distance from them. In the case of large rivers care is taken to keep the stream from overflowing the banks, but we know of small creeks running through valuable land where short-sighted farmers, instead of trying to keep the water in the stream, direct it to their neighbor's land. We do not think their intention is to injure their neighbors. They verily think they are drying their own land. And, in special instances, such is the case. We know two large farmers, A and B. The farms are adjacent, and both are on the same creek; but the creek runs for quite a distance through A's farm, and in fact through three or four other farms before it reaches B's farm. B cut a ditch several hundred rods long, in hopes of draining his land. A, instead of draining into the creek, runs his water into B's ditch, and though his house is not more than forty rods from the creek he has constructed a sewer from his house to B's ditch, and turns all his sewage into it. A claims that the land falls as it recedes from the creek, and that he has a right to let the water run where it will. "But not into a ditch I dug for my own use," says A. And he filled up a portion of his ditch and constructed another one on higher land into which he turns A's sewage, and uses it to irrigate his meadow.

Is it a fact then, that a natural creek does not run through the lowest land? Certainly not; the trouble in the case alluded to is simply that the creek is full of impediments. It is very crooked, and there are numerous logs, roots and branches in the stream, and for quite a distance on A's farm the creek in summer is almost dammed up with water-cress. This is the reason why the creek looks higher than the land a few rods back. The water in the creek is dammed up and wherever it has a chance it overflows its banks, and several farmers on this same creek are unwise enough to cut ditches to carry the water from the creek on to their neighbors' land. The present year four or five industrious small farmers who raise garden crops on mucky land had all their crops destroyed by water which a neighbor above them had diverted from the creek. This is not only illegal, but it is foolish. The only remedy is to clean out the creek by removing the logs and other impediments, and cutting off the sharp angles with a little judicious digging, to deepen and widen the creek where it is specially needed. The water, if confined to the creek, will, during the floods of spring, do much toward cleaning and deepening the creek. As it is now, comparatively little water runs through the creek. The water has been diverted from the creek, and floods many acres of good land, and converts it into an unhealthy and profitless swamp.

To Make American Cheese Profitable.—Whole milk American cheese can compete successfully in our markets with foreign cheese if it is given a little extra time and handling. Cheese, like fruit, must be ripened. Green cheese is fully as indigestible as green fruit, and about as tasteless. Whoever will test cheese at intervals of two to eighteen months will find gratifying and satisfactory changes in quality, flavor, and digestibility. Cheese can be cut from for a whole year if the cut surface is kept carefully covered with waxed paper.

ROASTED COTTON-SEED.

G. J. GREENE, GEORGIA.

No agricultural product has attracted greater attention, or increased more in value upon its own merits within the last twenty years than cotton-seed. Since the invention of the cotton-gin, which made cotton a profitable crop, little or no attention was given to the seed until within a comparatively recent period. In its raw state it has an intensely disagreeable taste, and the laxative property of the oil contained makes it almost impossible to feed it for any length of time to animals of any kind, and none will eat it except upon compulsion. But few planters used it as a fertilizer by composting or otherwise, and for that long period of nearly three generations it was simply wasted, not ten per cent of its actual value being secured in any way. The invention of the process for extracting the oil laid the foundation for a great and profitable industry, and gave to the seed a new and permanent value. So great has this industry become that it involves enormous capital, and the use of ponderous and costly machinery. One of the products of this industry is cotton-seed meal, now known to almost every farmer as a valuable animal food. A very large part of it however is used in making a fertilizer by compounding it with phosphates and potash.

The use of cotton-seed meal has become very great throughout the Northern and Eastern States; many think it desirable to mix with other feed, while some look upon its use with positive disfavor. All these are right or wrong by turns, or may be; chemical analyses show that cotton-seed meal is rich in all the material for forming flesh and muscle.

Roasting cotton-seed to be used as animal food is a comparatively new use for the seed. It has been used in the South to considerable extent for the last two years, and has everywhere given the most complete satisfaction. The roasting process entirely eliminates the disagreeable flavor of the raw seed, and a palatable wholesome food is produced that is eaten with great relish by any animal that will eat corn meal. It contains all the rich properties of the seed, none of them being extracted by passing through an oil mill. Oil-mill meal contains ten per cent of moisture, and it often molds, and becomes musty and sour, while the meal from roasted seed, having fifteen per cent of its weight evaporated in the roasting process, is very dry and will keep sweet and good for any length of time. The process is so cheap and simple that the farmer can roast his own seed. But mills are now being built to roast and grind the meal for market. A great industry will doubtless grow out of it, as the demand will be great wherever known, and it requires neither the capital, machinery, nor experience of an oil mill to produce it.

FERTILIZING APPLE ORCHARDS.

H. REYNOLDS M. D., MAINE.

Apple trees will bear fruit of fine quality and in considerable quantity with very little fertilization, and, because they will, the practice of neglecting to fertilize them has become quite common, or, more correctly, has always been so. Nearly all apple orchards are in grass, which is mostly cut for hay and removed from the land. Some pasture sheep in the orchard. That is better than cutting the grass for hay. Sheep enrich the soil, and eat the wormy fruit that falls to the ground, thus helping to keep the codlin moth in check. Some owners fertilize their orchards by top-dressing with barn manure, wood ashes, or superphosphate. It is doubtful, however, about the trees getting a very large share of such dressing. The grass forms a thick, tough sward, through which the fertilizer penetrates with difficulty and is very likely to be absorbed by the grass roots before it gets down to the apple tree roots. If very heavily dressed repeatedly, perhaps the trees will receive considerable benefit after awhile, but ordinary dressings probably reach very little below the grass roots, so that practically the trees are not much benefited by them. It is surprising how much fruit some orchards will produce under the treatment to which they are subjected. Yet no doubt under better treatment there would be a great improvement in the quality of fruit produced, as well as in the quantity. The quality of fruit from a well-fed tree is as much better than the fruit from a half-starved tree as the beef from a

well-fed steer is superior to that of a poor, half-starved one. An apple tree, from the time it is planted in the soil, should always be well supplied with needful plant food. It will not do to set trees in poor soil, and allow them to struggle on, making a small, stunted growth, or a part of them dying within a few years. After growth has once been checked in young trees it is very difficult to get them into a thrifty condition. Trees that have fallen into an unthrifty condition are less able to withstand the ravages of insects and the vicissitudes of climate. By having the soil in good condition before the trees are planted, and keeping it in good condition, the trees will grow rapidly and soon attain a good size for bearing fruit. Much of the delay and vexation in rearing apple orchards is due to the fact that the soil is not rich enough, is not kept well cultivated, and is not sufficiently enriched to maintain a continuously thrifty growth. No one can afford to wait the slow growth of trees in poor land, insufficiently fertilized. It is important to keep the trees growing rapidly, and bring them to a size large enough for bearing as soon as can be done without injury to the trees. The danger of injuring the trees by too rapid growth is seldom realized in this part of the country. Our soil is not naturally rich enough to be in any danger of being injured by too much fertilization. Where one orchard is injured by being fertilized too much, there are hundreds stunted by not receiving enough fertilization and cultivation. An orchard that is kept thriftily growing will produce enough fruit, before a less thrifty orchard would begin to produce much, to repay all the extra care and cost. There is some difference of opinion as to the best method of fertilizing an orchard, whether by top-dressing or by mingling with the soil. If the surface is cultivated, there would be little difference in the effect produced, either by cultivating the dressing in, or applying to the surface. If applied to the surface, the rains would dissolve the soluble portion and distribute it to the soil, and the next time that the surface was plowed or cultivated the whole would be well mixed with the soil. The best treatment for young trees is to keep them cultivated until seven or eight years at least. Then the land may be seeded to grass, if desired, and pastured with sheep. Or the surface may be mulched with hay or straw, and fertilizers applied by top-dressing. Upon a mulched surface the fertilizers would readily find their way into the soil and reach the roots of the trees. The roots of the trees would lie near the surface, and there would be no grass roots to gather up the fertilizers before they reached the apple tree roots. Even when grass is allowed to grow in orchards, it is much better to mow it and allow it to decay upon the surface, serving as a mulch, than to remove it. A mulched surface is very favorable to the attainment of the best results in apple production. If trees are too close together in the orchard, so that they are crowded, the difficulty can be remedied in part by mulching and fertilizing freely, supplying abundant plant food to secure good crops of fruit. Fertilizing well pays the cost in increase of fruit. Without it many orchards are worth more for firewood than for fruit.

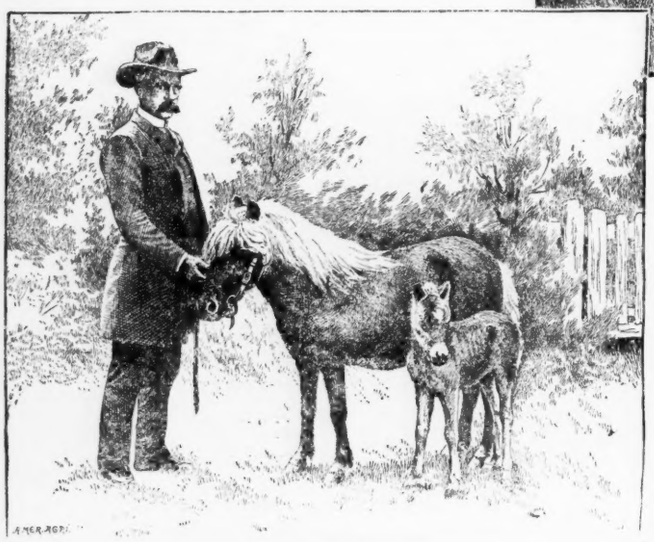


FIG. 1. SHETLAND PONY MARE AND FOAL.

SHETLAND PONIES.

These hardy, docile, intelligent equine dwarfs are alike the pampered pets of children, the humble helpers of the poor Scottish crofters, and useful toilers down in depths of English coal mines. Much has been written regarding their origin, but nothing positive elicited. They have many characteristics which indicate a remote Arab ancestry. From whatever source they sprung there is no doubt that they have been reduced to their diminutive size by the vicissitudes, through successive generations, of scanty food and depressing climatic conditions. There are various types of ponies on the Shetland Islands, the variations resulting from difference of environment. The handsomest and best adapted to the market as family pets are mostly bred on the South Mainland, the largest of the islands; those of Unst and Yell are very useful there, and in demand for "mine ponies"; while the little island of Fetlar has a quite distinct breed of its own, the result of out-crossing.

However great may be the local and other variations among them, all pure-bred Shetland ponies have certain characteristics in common. In height they range from nine to twelve hands; that is, from thirty-six to forty-eight inches, and in exceptional cases even less; a pure-bred Shetland pony has bright, expressive eyes, an intelligent countenance, lean, blood-like head, well set on a rather short neck, fine at the thrapple or throat-latch, muscular arms and thighs, sloping shoulders, clean, flat legs, round, perfect feet, short back, well-sprung ribs with great depth of chest and sweeping mane and tail. The Shetland stallion Sparkle, and the mare, shown in Figs. 1 and 2, are good specimens of what may be regarded as the domestic pet type of Shetland ponies. Both are the property of Capt. J. Murray Hoag, of Iowa, and the former has taken prizes wherever exhibited. He is a beautiful and highly educated animal, with an intelligence almost human.

FIG. 2. SHETLAND STALLION SPARKLE.

The Fetlar, or Lady Nicholson pony, one of which is shown in Fig. 3, is larger and less docile than the pure-bred Shetland. Many years ago Sir Arthur Nicholson, of the island of Fetlar, introduced an Arab stallion which was crossed upon native mares, and from that cross the present Fetlar ponies descend. They have a certain value of their own, but lack some of the qualities which make such favorites of the Shetlands.

There is a great contrast between the aspect of the summer and the winter coats of Shelties. The former is fine, close and sleek. The winter garb more nearly resembles in length and texture that of an American bison, being immensely long, thick and shaggy. When this hangs in rags and patches, during the moulting period in spring, the little animals present an aspect at once ludicrous and pathetic. In color they have the same wide range as any other horses, though there is a tradition that brown was the original hue. Shetland ponies are remarkably tough and strong for their size. In their native islands it is not an unusual sight to meet a pony mounted by a long-legged crofter whose feet would almost touch the ground on each side did he not draw up his knees until he had nearly shut himself up like a jackknife. They are wonderfully sagacious, hardy and docile. Obliged, as they have been for generations, to pick their way down steep declivities and amid bogs and morasses, laden with heavy "cassies" of peat, they have become

sure-footed and sagacious. When one of them encounters a suspicious place with a treacherous covering of moss or ice, he ascertains by simply sniffing the surface whether it is safe to venture upon it. Reared as they are on the bleak, foggy islands with scanty herbage and little or no grain, and finding temporary refuge from the severest wintry storms in the humble shealing which also sheltered the family, they could not be otherwise than hardy and docile. In fact, the greatest obstacle to successful keeping, and especially of breeding them when recently imported, arises from overfeeding and too close stabling. If not clipped in winter a stable so loosely boarded that the wind has free play through the cracks is far more conducive to health and vigor than a closer and warmer one. Breeding is out of the question unless the mares are kept in somewhat low condition. Gentle and familiar as they are, there is a limit even to their docility. A beautiful little stallion, known to the writer, had been persecuted by boys who thrust sticks at him between the palings of his paddock until he became furious and was actually dangerous to man or horse that entered his inclosure. But it is only by willful and wanton abuse that their innate good nature can be soured. The youngsters of Shetland ponies are the most interesting and amusing little animals in the world. A perfectly vigorous foal may weigh as little as twelve pounds at first. They are singularly tender for offspring of such a hardy race, but very soon they become strong on the legs and very active. They have none of the "pretty ungainliness" of larger foals, but are well-formed, symmetrical little horses, as tame and familiar to their friends as kittens and as playful as kids. A favorite amusement with one of them is to start a little circus of its own, galloping round and round in a circle for half an hour at a time on the springy pasture turf.

FIG. 3. FETLAR OR LADY NICHOLSON PONY.

The ponies of the island of Unst, one of which is depicted in Fig. 5, generally lack the symmetry and beauty which some expect in a pet pony, but they are strong, well-bred, hardy and wonderfully sagacious. The pony Dumpling, which was exhibited by Miss Counsuelo Vanderbilt in the New York horse show of 1888 and took the first premium, was of this class. Low and podgy in form, it had a fine, intelligent head, clean limbs and an affectionate intelligence which made it a great favorite with its young mistress. As mine ponies they are very useful and there is an active demand for them for use in the coal mines of the northern parts of England. The ponies of Yell are the smallest, hardiest and roughest of all.

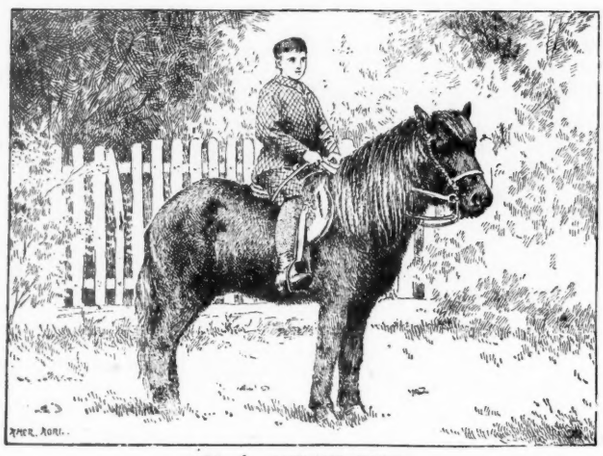


FIG. 4. ICELAND PONY.

Shetland ponies have become very popular in the United States and the numbers here have greatly increased within a few recent years. With the great increase of wealth has come the ability to gratify the wishes of the children for pets, and these ponies are pre-eminently the breed for the children. Several very fine pony studs have been established in Iowa, Illinois, Michigan and some of the Eastern States where they are bred pure from imported stock selected with much care and cost. But a large amount of imposition is practiced by some dealers who sell Iceland, Hungarian and other breeds of ponies under the name of Shetlands. Iceland ponies, of which one is represented in Fig. 4, have coarser heads, less intelligence and are much shorter lived than Shetlands. The latter, with judicious usage, retain their vigor until twenty years old and survive until twenty-five; but the Iceland ponies rarely attain more than half that age. To preserve the purity of the breed, "promote the introduction and rearing of high-classed ponies and the publication of a stud-book," the American Shetland Pony Club was organized last year. Its officers are as follows: President, Charles P. Willard, Chicago; vice-president, Mortimer Levering, Lafayette, Ind.; secretary, Capt. J. Murray Hoag, Maquoketa, Iowa; Treasurer, A. R. Galbraith, Janesville, Wis. The first volume of the stud-book will be published as soon as 1,000 ponies eligible to registry are presented, of which number something more than half have so far been received. The club is harmonious and prosperous and bids fair to maintain in this country the pure breeding of these favorite little animals.

HOLDING GRAIN FOR A RISE.

During any ten years, the man that sells his wheat and oats soon after they are thrashed will realize more from them than if he stores for a better price. The man that holds for a better price must have a granary, even though the bins are empty nine months of the year. Interest on the cost of the granary and wear and tear to the building must be deducted from the amount realized for the wheat in making the comparison, for the man that sells from the machine is at no expense for granary. The best granary is the cheapest, as with it there is the least waste of grain; but, in even the best granaries there are possibilities of damage by weevils and mice. The cost of insurance must be charged against the wheat held for a better price. It will also lose in weight in the granary. During a term of years, cost of granary, loss through weevils, mice, etc., insurance, shrinkage in weight, and interest on the money that could be made productive were the grain sold at once—and

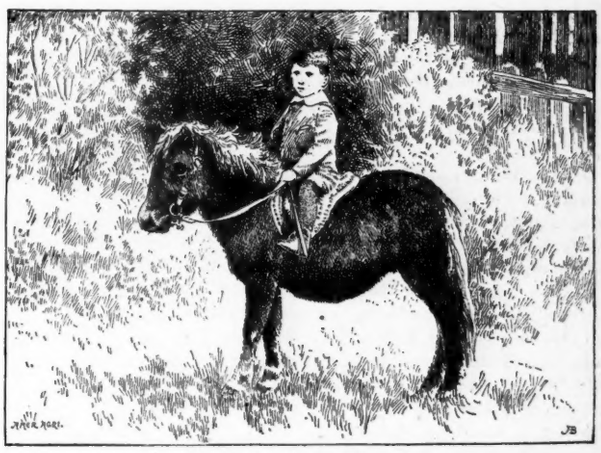


FIG. 5. SHETLAND PONY OF THE OLD STYLE.

which must be considered—these things will amount to more, taking one year with another, than the increase in price.

During the year there is often a considerable advance in price after thrashing time, and if the farmer were endowed with foreknowledge, and always got the highest price, he would be ahead by holding his grain. The advance during the year is not so sharp now as formerly. This is due to better transportation facilities, and the development of the elevator system, particularly in the Northwest, and to the growth of the large mills and milling centers having large capital.

WHAT THE SEASON HAS TAUGHT.

MISS H. C. DUDLEY, KENTUCKY.

There is a theory among poultry-keepers that when hens produce many eggs during winter their eggs in the spring will, to a large extent, prove infertile, and that the few chicks hatched will be delicate and hard to raise. They therefore advise that hens whose eggs are to be used for hatching purposes should not be encouraged to lay until February and March, and, even then, that only the first of a clutch should be set, as the last are likely to be sterile. Carrying the same principle still further, they recommend that no chicks at all should be hatched in June, as by that time they say the vitality of the egg is so low that the small number of chicks hatched will eventually "sleep themselves away."

Now, as it happened, my experience this season has proved the opposite of all these theories. My flock of hens, one hundred and twenty in number, part Plymouth Rocks, part Brown Leghorns, and the remainder a cross between the two breeds, averaged about fifty eggs a day from the 1st of January until I began to sit hens, in March. The eggs then hatched well, and a large percentage of the chicks, in spite of the very cold and inclement weather that followed, lived and grew rapidly, showing no constitutional weakness whatever. The second lot, which came out in April had to endure a month or six weeks of cold, chilling rains, and consequently did not do so well, though as soon as fine weather came they grew beautifully; but the third lot, hatched in June, is as thrifty, hearty, and lively a little set as anybody ever saw. I never knew eggs to hatch as well, and there has scarcely been a loss of one chick to each brood. They are always going and always hungry. So I am inclined to think that the unusual mortality complained of among June chicks is either owing to the fact that they are not liberally enough fed to enable them to support life, and grow feathers at the same time, or that the chicks are not kept free from vermin, which at this season of the year are particularly active.

While the fact that the eggs from my flock hatched well all the season, although the hens had been remarkably good winter layers, proves that when the stock is strong and vigorous, and the flocks properly cared for the eggs will hatch any time they are set. I regret to find, however, that the Brown Leghorns, after being kept on the farm for several years, where they have unlimited range and a great variety of food, cease to be non-sitters. And, while they do not become such inveterate brooders as the Plymouth Rocks, yet, if permitted, they will keep the nest long enough to hatch chicks, and will go with them, too, until the proper time for weaning. The Leghorns still remain the best layers I know anything about, and the chicks, after they are two or three weeks old, are remarkably healthy and thrifty, though before that the little pullets especially are somewhat delicate. It is interesting to note that among the pure-breds the markings of the sex are unmistakable, the little cockerels being much darker in color. They are very precocious, too, and, before you know it, they are beginning to shoot up tall red combs, and are trying to crow, though their little notes are so weak that it seems as if the "crow" came from a long distance. About this time, too, they show a great propensity for roosting in tree-tops, and are decidedly cocky in general. Of the cross between the two breeds, the pullets are full breasted, handsome and symmetrical, active and energetic in disposition, proving excellent layers, and frequently good brooders and affectionate mothers.

With a flock of mixed breeds, it is better to keep pure-bred cocks of the larger breed, else the size will deteriorate. Such a flock, when allowed unrestricted range on the farm, will raise a large number of chicks and yet furnish an abundant supply of eggs all the time, the one breed complementing the other, so that we may safely undertake year-round engagements. The cockerels of this cross, when well fed, will attain a fair broiling size when two months of age, and the pullets frequently begin laying when between five and six months old. For healthy and rapid development, young pullets should be allowed all they will eat three times a day. Their rations may consist of one-fourth cooked food, as boiled cracked corn and wheat, one-fourth ground grain, and the remaining half of raw grain. The same ration is excellent for laying hens, taking care that in warm weather three-fourths of their allowance shall consist of those foods which furnish a preponderance of material for egg-making, as wheat and oats; and the rest of Indian corn, potatoes, etc., which go to make heat and fat. In cold weather the proportion of corn may be increased, and more meat given to take the place of insects. An abundant supply of milk at all seasons is invaluable when used in this direction.

SHIFTLESS TRICKS FOR A FARMER.

DR. G. G. GROFF, PENNSYLVANIA.

To try to farm without manure.

To plant more acres than can be taken care of.

To work with poor tools, and to sow poor seed.

To buy at public sales what is not needed, because it sells cheap.

It is shiftless to keep poor stock. A poor cow eats as much as a good one.

To lounge about stores and groceries when it is possible to be doing something at home.

To raise frogs and mosquitoes in the front yard. To have a pig-wallow in the road near the gate.

To allow the hogs and sheep to wander at their own sweet will over their owner's and his neighbor's premises.

To allow the barn-yard to drain into the public road, or into a stream. A good many farmers are guilty of this.

To cut the wood for the kitchen fire day by day and then burn it green. It is worse to leave it for the wife to cut.

To let the cattle fodder themselves at the haystack. It saves a little labor, but the waste will make their owner poor.

To have the privy and well near each other. They should never be less than 200 feet apart. The privy should be below not above the well.

To leave tools of any kind lying out in the weather; to put them away uncleaned, or to loan them to shiftless and careless neighbors.

To turn the cattle out into the bare fields in cold weather when there is nothing for them to eat there, and they lose flesh shivering in the cold.

It is shiftless to allow weeds to occupy any portion of the farm, and very shiftless to allow bushes to occupy several rods of ground along the fence rows.

To plant an orchard and then to allow cattle to browse the trees; to leave vacant places in a young orchard; to allow a young orchard to remain in grass.

It is short-sighted policy to elect to the township and county offices the men who can not support themselves in the ordinary pursuits of life. It is also costly.

It is a thoughtless and a very dangerous thing for a farmer to put his name on any paper presented by a stranger. Also, to go on the notes of friends and neighbors.

It is reckless to buy trees of an utter stranger; also, groceries, spices, and such articles as can be easily adulterated. Nine times out of ten one will be cheated by so doing.

It is a shiftless trick to employ the teacher who will work for the least wages. It is as bad to leave a family of boys and girls to grow up without good books and papers.

To wade through mud to the barn and outbuildings when good dry paths can so easily be made. To pay heavy doctor's bills for wife and children because their feet became wet through lack of good paths.

It is a heartless thing for a farmer to allow his wife to work sixteen or eighteen hours, when his own work is completed in ten hours. On the farm as elsewhere husband and wife should be "equal partners."

To have no garden and to buy stale vegetables of a huckster. It is nearly as bad to have a miserable little garden, which the good wife and her girl painfully weed, and secure a few stunted vegetables, when large crops could be had with little trouble, if the garden were cultivated by horse power.

SUGAR-CANE CULTURE IN LOUISIANA.—II.

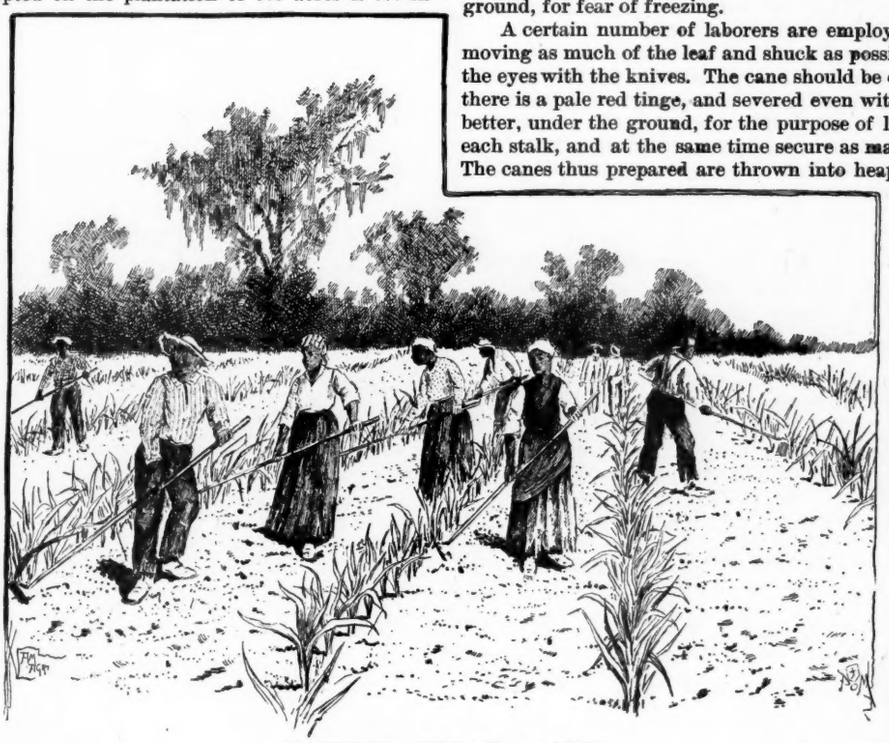
THOMAS MANN CAGE.

Owing to the very gradual fall of the land from river-front or bayou-bank to swamp (often not one foot in two hundred), and flooding rains in winter and early spring, numerous ditches and canals are necessary to carry off the surface water with rapidity. The small ditches are generally at right angles to the stream, and seventy yards apart. On some places they run the entire depth of the land under cultivation, widening as they approach canal or swamp; on others they empty into parallel ditches, and discharge into larger ones, which convey the water to the outlets. The more systematically a place is ditched and thoroughly drained, the better the results obtained from crops grown. Numerous roads for the convenience of hauling and cultivation divide the estate into parallelograms and squares, and are generally placed on the sides of the parallel ditches. When the lands had been cultivated but a limited number of years in cane, the stubbles or ratoons were retained three or four years, but at present it is conceded that it is safest to rely on plant-canes and ratoons of the first year. Ratoon and stubble are synonymous terms, applied to that part of the cane which remains between the stalk or mother, embedded in the earth, and the point above the ground where the cane has been severed by the knife prior to transit to the mill.

The rotation adopted on the plantation of 900 acres is 300 in corn, 300 plant-cane, and 300 of stubble. Experience has demonstrated that recuperation every third year is of marked benefit, as it is a check to the exhaustion of humus and nitrogenous compounds. The result is attained by planting from one to two and a half bushels of Carolina cow-peas per acre, when the corn receives its last working. The vines form a perfect mat of vegetation, such that the land is entirely hidden from view during July and August. The land thus treated produces three crops the same season; one of corn, one of hay, and one of manure; the latter from the roots, part of the vines, and some of the leaves, all rich in potash and nitrogen, so essential to the luxurious growth of the crop of cane to follow. Theoretically, there should be one part of corn, another of plant-cane, and lastly, but the stubble; for convenience in planting, etc., the field presents somewhat the appearance of a checker-board. The corn is gathered in the large cane-wagons or carts, and only slip-shucked in the field prior to cribbing. After the corn has been gathered, hay is made of the pea-vines, which are either cut with a hoe and scythe or pulled with a rake, which answers a good purpose. It is generally housed under sheds, in lofts or out-houses. As only a certain portion of the pea-vines grown is required for hay, the balance, with the corn-stalks, etc., are plowed under in the autumn. The object aimed at is to expedite corn-gathering, hay making, and plowing all the land cultivated in corn, so that the entire force on the place can be employed in planting cane before sugar-making begins, as many planters desire to get one-third of it accomplished in the autumn, it being less expensive than deferring it until spring.

The benefits derived and the results which accrue from deep plowing in the fall are more and more appreciated each year. The turning under of a large amount of decaying vegetable matter, rich in potash and nitrogen, obviates the necessity of such heavy fertilizing as would otherwise be required to produce maximum yields. The lands are sometimes flushed, but many prefer to simply reverse the corn row with as many furrows as are required, with a four- or six-mule plow, leaving a deep-water furrow on each side of every row. As each square as it is turned is thus treated, cross drains, at intervals of an acre or more, are run out with the plow, and should be spaded out from ditch to ditch, to permit of the rapid egress of the water off the land, so that shortly after heavy rains no water remains stagnant over the fields. All ditches running through, or at the end of land to be planted in cane, should have the earth to the depth of a foot removed in the autumn, to insure thorough drainage during the winter and early spring. The necessity of such precautions will become apparent when it is stated that the average rainfall is from fifty to sixty inches per annum, and at times six inches of rain may fall in as many hours. All other field-work having been completed, the balance of the time can be devoted to planting cane, which should be permitted only on the best-drained and most sandy soils on the estate. The supposed advantages of fall planting are that the expense of putting the seed-cane in windrows is saved, and less work has to be done in the spring. However desirous it may be to accomplish the operation, yet it should never be done except when the soil is fine, with plenty of moisture to start the rooting of the canes, which takes place at the joints. It is not desirable to have many of the shoots appear above ground, for fear of freezing.

A certain number of laborers are employed in cutting and removing as much of the leaf and shuck as possible, without injuring the eyes with the knives. The cane should be cut at the joint where there is a pale red tinge, and severed even with the surface, or, still better, under the ground, for the purpose of leaving a little root to each stalk, and at the same time secure as many joints as possible. The canes thus prepared are thrown into heaps, ready to be loaded on the wagons, which closely follow the cutters. As each wagon is loaded, another is driven into place, and thus load after load is hauled to the field where planting is progressing. The rows having been previously plowed, all that remains is to prepare the soil for the receipt of the canes. A two-mule, V-shaped harrow is first passed on the row to render the soil pliable, then follows a double plow, which opens the row on two furrows. The bed for the canes is then prepared by passing the fluke (which is simply a somewhat elongated double-mold board plow) where the plow has opened. The action of the fluke is to remove any small clods, leave a level surface, and bank the loose earth on each side, ready for the hoe or single plow to cover the canes.



HOEING SUGAR-CANE.

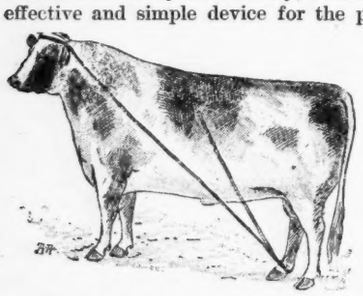
To compensate for the loss of the pea-vines, the phosphatic and nitrogenous refuse of pork packeries, at the rate of from three to five hundred pounds per acre, can be put in the drill prior to planting. As each load of cane arrives it is seized upon by cane-strewers (generally boys) two to a row. They are followed by a female dropper, who places the canes in the row according to instructions—the amount varying from two to four canes, but generally two stalks with a lap of six inches. They again are followed by careful females, who see that the canes are straight in the row, and cut those that are too long or crooked. Then a gang with hoes follow and cover the canes uniformly with from two and a half to four inches of loose earth, according to the views of the manager. Should the land be in very fine tilth, and labor scarce, then the work can be done nicely with a single plow and careful man. If the land is not in exceptionally fine condition, the canes should be rolled after plant-

ing, to insure the packing of the loose earth nicely around each cane. The important operation of fall planting is deferred until the latter part of September and October. It would be dangerous to plant much earlier, as the canes would come up, grow too large, and be killed by a freeze in winter. As a rule, the smallest canes are selected for fall planting, as they seem to resist the vicissitudes of winter better than the less watered stalks.

As soon as the young sprouts appear a few inches above ground the process of cultivation begins. The earth is hauled around the plants a little at each successive hoeing, until the holes in which they stand are filled level with the general surface. The weeds must be diligently removed and the surface kept mellow and friable. The offshoots or suckers which spring from shoots are taken off, as they will draw nourishment from the plants and seldom make effective canes if left to grow.

HOW TO THROW AN ANIMAL.

It sometimes becomes necessary to throw a bull, steer or cow for surgical or other purposes. It must be done with the least possible danger of injury to the animal. Our illustration, drawn after a sketch sent us by A. Moseley, Jackson Co., Wis., shows a very effective and simple device for the purpose. A sound, half-inch rope is secured at one end to the base of the horns. A slipping noose must not be used, but a knot tied at the extremity is drawn into a loop at the proper place. The next operation is to get the off hind foot into a large loop of the rope, which is then drawn taut between the hoof and the dew-claws. The operator now stands close to the near hip with the loose end of the rope firmly grasped in his right hand. Seizing with the left hand the other part of the rope he gently but firmly pulls the head toward him, at the same time taking up the slack by holding all taut with his right hand. Soon the distance between horns and heel will be so shortened that the animal will come down on its haunches, and then on its off side. All is held taut while it is necessary to hold the animal down to pick out any nails or snags from its feet, pare the hoofs and anoint for hoof-ail or any other purpose.



DEVICE FOR THROWING AN ANIMAL.

PURE-BRED POULTRY ON THE FARM.

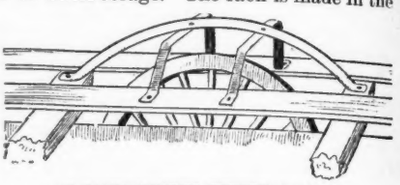
E. M. BROWN, OHIO.

September is the month in which to assort the chicks. Pick out the best to carry over the winter, and breed from next season. Many do not realize the importance of this; but the inferior chicks never pay for the food they consume. The balance of the flock will have more advantages after the culling has been made. More revenue will be gained from the remaining lot than from the entire flock if retained. It is now "fair" times, here and there. Select the best pure-bred poultry, and exhibit them at the nearest fair; incite an interest in well-bred poultry, if not already awakened, and show neighboring farmers what you have. If they have not as good, it will interest them, and you may sell some stock, or take orders for eggs for the coming season; besides the chance for carrying premiums. Next fair season some of the neighbors will enter into competition, and then you will want to maintain your ground with your second exhibit, and have an extra lot of fine birds to show. Farmers should learn the advantages of rearing thoroughbred poultry; by studying the exhibitions at fairs he familiarizes himself with good, pure-bred poultry, and can compare it with his common stock, which results in giving the preference to pure stock every time. Thus is laid the foundation and incentive within him to improve his stock. In time he will be found glorying in the possession of as fine a flock of pure-bred fowls as the surrounding country can boast. It is impossible to have too many interested in this matter, and the farmer especially should become familiar with the advantages of breeding and raising pure-bred poultry.

Eggs for Incubators.—Eggs for hatching in incubators, when properly produced and cared for, command top prices. Their increased value well repays the extra care required. Hens from one to two years, with cocks of same age, are best for this purpose, and ten hens to a cock is the proper number. Pullets and cockerels throw weak chicks. Some farmers make a specialty of supplying eggs for incubators, receiving as high as fifty cents per dozen for strictly choice eggs of white varieties, these being preferable to colored chickens for broilers.

NEW USE FOR OLD WAGON TIRES.

Our engraving, from a sketch furnished us by S. A. Asquith, Black Hawk Co., Iowa, represents one corner of a wagon rack for hauling hay, corn fodder or other forage. The rack is made in the usual manner, with transverse pieces of four-by-four scantling supporting inch boards extending lengthwise of the wagon. The wheel guard is made of pieces of worn-out wagon tire, cut, bent and drilled without heating. The ends of the longest piece are held in place by bolts four and a half inches long, with nuts below the scantlings; the shorter pieces by inch and a half bolts. The irons are riveted together at their intersections. The device is cheap, effective and durable.



AN INEXPENSIVE WHEEL-GUARD.

HOME-MADE SQUEEZER.

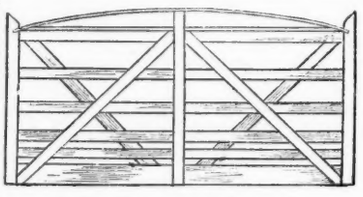
Mr. J. M. Teeters, Macoupin Co., Ill., sends us a model and description of the cheap and convenient implement illustrated herewith. It is designed primarily for pressing lard from the cracklings, but may also be made useful to squeeze the juice from fruits. It is made of two pieces of hard wood, each four feet long, four inches wide, and an inch and a half thick. The two are united at one end by a wrought-iron butt. The other end of each one is tapered to a handle, as shown in the engraving. When it is to be used, the cracklings or fruit is placed in a bag of stout sacking, which is inserted in the squeezer as near the hinged end as practicable, and the handles brought toward each other. This gives a powerful leverage, and performs the work quite as well as can be done by a more expensive press.

A SERVICEABLE SQUEEZER.

A STRONG FARM GATE.

William Geunner, St. Louis Co., Mo., sends us a drawing of the neat and strong farm gate shown in the engraving. The upright at each end is three by four inches; the bottom board is six inches wide; all the rest of the gate is made of inch boards three inches wide. The middle uprights are nailed on both sides of the gate; the other constructive details are so plainly shown in the illustration as to need no explanation.

Have Clean Fruit Holders.—Fruit in basket quickly decays, and the dealer holds his breath during the berry season from fear of the deadly mold and other fungi. They come at the wrong time; they come suddenly and do their work quickly. In looking over a number of crates of perishable fruits recently it was noticed that the boxes were old. Likewise the quart baskets were ancient, weather-stained, but worse than all else, there were the indications that fungi start from these old baskets. In other words, the baskets themselves are the homes of the fungus-spores that spring into life so soon as new fruits come in contact with the surface. Now, if this be so, and it seems very reasonable, there is some importance attaching to a systematic fumigation or soaking of these old boxes and baskets. Subjecting them to the fumes of sulphur would kill off a large share of the germs. Perhaps as good a way would be to soak them in water at near the boiling point for an hour or so from time to time. The grower may think it is no object to him, but the dealer will be quite sure to favor the ones who sell him fruit that will keep the best. We all need to look more to the "long run," and remember that it is made up of the "short runs."



WELL-BRACED FARM GATE.

A CITY EGG-FARM.

FANNY CASSADAY DUNCAN, KENTUCKY.

Our house has around it a little lawn, the rear half of which is shut off from the front by high pickets with a gate. This leaves the back end of the lot free, secure, and secluded. For further security in a big city, we have a shepherd dog to watch, and two Scotch terriers for rats. Just beyond this wicket we begin farming. Along the side division-fence are three little houses for breeding-pens, and to keep the various breeds separate. The side fence forms the rear wall; the front is composed of sliding boards which can shut up the pens securely; left partly open, will allow the egress of chickens; or, more fully open, will admit a man. In front of these pens we have made a little run or yard, inclosed with wire netting. All this is shown in Fig. 1.

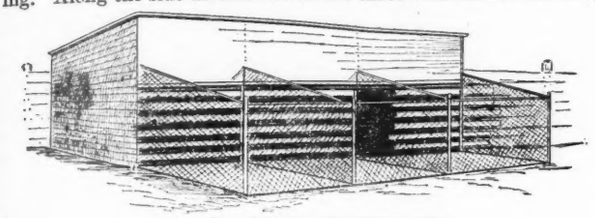


FIG. 1. HOUSE AND WIRE RUN.

Our city lot is fifty feet front by two hundred deep. When we had completed these pens we had used up about twenty-two feet in length and twenty-two in width. Each of these places will hold seven hens and a cockerel of the larger breeds, and more of game or Leghorns. We advise the use of the larger breeds for city raising, as they are not apt to fly over fences and are sooner ready for broiling or roasting. The poultry-houses should be whitewashed on the inside. There should be added three tablespoonfuls of carbolic acid, and a pound of sulphur to each pailful of whitewash. Apply the wash to every corner and crevice in the building. The best floor is of broken stones about a foot deep, on top of which is thrown sand or sandy soil, and over the whole is poured liquid cement. When the cement hardens it makes an elastic, dry covering, from which all droppings, litter, feathers, and dust, can and should be raked off three or four times a week—our man does it every day. In the adjoining yard dig up a heap of earth and sow with corn, rye, or wheat, which the hens will scratch for, and so get the needed exercise. The rest of the little lot—and let this space be as large as can be spared—should be devoted to grasses for green food. The grass cut from the front lawn can also be utilized as food, being cut in small quantities from day to day. Drainage is of the utmost importance. Cleanliness in chicken-raising is the price of success. Care, not luck, wins. The floor should be at least six inches above the general level of the ground outside, so that no water can run into the house. The city farm I am describing—and where, by-the-way, we had 3,652 eggs laid in one year—is in a mild climate, where the thermometer rarely ranges below zero. The winter hennery is a wooden house, originally built for a carriage-house, which we adapted to our needs as a hennery. Into this we let two large square panes for sunshine and light; made a slide in the wall for the use of fowls in bright weather, and put into the house all necessary dust-boxes, perches, nests, and the like. We give, in Figs. 1 to 6, illustrations of this hen-house, with run attached. These buildings extend along, and wall up securely, the rear of the lot next the alley, making it safe from thieves. B, Fig. 3, is the sliding-door open into the run; C is the slide, and D the dust-bin. This bin is simply a box containing dust—not filthy dirt, or coal-ashes, but very fine sand—with which a little sulphur is mixed; copperas is first put into the bottom of the boxes. The copperas and sulphur kill any insects that may have come upon them. Sulphur is occasionally burned in this house, and lime is used in abundance. There is absolutely no foul smell in this house at any time. In bright weather the chickens are allowed to run into the yard, shown in Fig. 2. Hens with young chicks in the summer are kept in the little houses on the side, and their chickens run in the little yards, seven feet square, which are protected by wire netting and by lattice-work. A coarse wire netting is stretched above the main chicken-yard. Into this winter hennery are brought all fowls from the breeding-pens when the season is over, and they run with those always kept here. Nest-boxes should be arranged so as to be secluded, since hens prefer a darkened, quiet nook, in which to lay. Those shown in Fig. 3 are stationary nests, not what we are using at present, nor what we consider to be the best. My own invention, shown in Fig. 6, is a box made of inch-square rods set two inches apart, and has a sliding floor, or a floor which can be slipped out and washed. These boxes secure three essential points, ventilation, retirement, and cleanliness. When the hen is hatching, the boxes are easily removed to a quiet, high, and safe place. If made roomy enough, nests can be used, after hatching, to confine the hen, and yet give free ingress and egress for the chicks. A word regarding feeding-boxes and drinking vessels. Food must be kept clean, and it must be impossible for the chickens themselves to make it otherwise. The old way of feeding in an open box, or on the floor, or on the ground, led to the fowls getting among the food and soiling it with their feet, or covering it over with their clumsy bodies. Beside this, old fowls and half-grown chicks would invariably fight for choice bits, picking away the little ones and leaving them to take the refuse or get none at all. We prevent all this by a very simple contrivance. Fig. 4 shows it open, and Fig. 5 shut. A fourteen-inch plank makes the whole thing. The bottom is fourteen inches wide; the box is fourteen inches high; the lower strip is three and a half inches; the strip to which the flap is hung is three and a half inches wide; the top measures seven inches across; and the handles are made of the trimmings. The cover is on hinges; can be raised for purposes of cleaning. The edges are made sharp to prevent them from being used as perches. The ordinary poultry-fountain is too well known to need description. Fig. 7 gives a form of it that has these

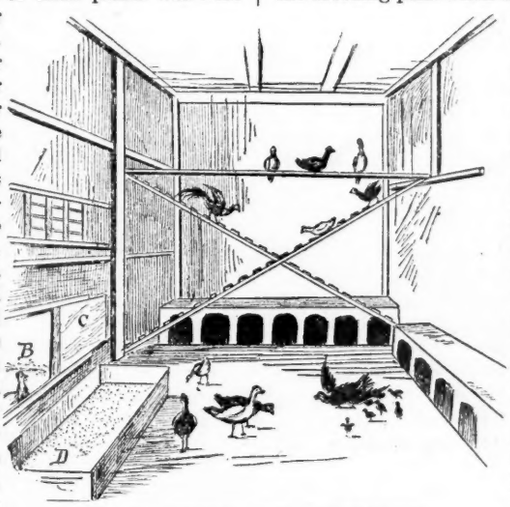


FIG. 3. INTERIOR OF POULTRY-HOUSE.

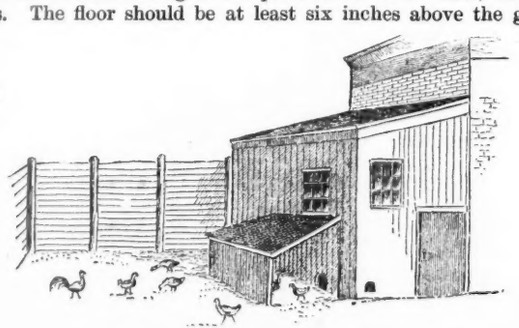


FIG. 2. POULTRY-HOUSE AND YARD.

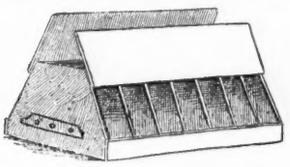


FIG. 4. FEED-BOX OPEN.

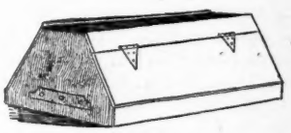


FIG. 5. FEED-BOX SHUT.

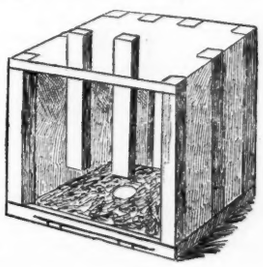


FIG. 6. NEST-BOX.

FIG. 7. DRINKING FOUNTAIN.

advantages: the top is an open one fitted with a cork, so that the attendant can see into the interior; having this open top, water can be well-sluiced through the fountain and thus remove all settlings and slime that even pure water is liable to collect.

AN IMPROVED PIGGERY.

The accompanying perspective view and floor-plan are of a piggery, designed with a special view to the convenience of brood sows, but equally useful for any other swine. It is thirty-two feet long. In height it is six feet in the clear at the eaves, rising to eleven feet at the peak. Directly over the center is a sort of cupola, eight feet square, resting upon four posts six by six inches, and thirteen feet high. Large windows on every side furnish ample light and ventilation. On the floor under the cupola is a hexagonal area, eight feet wide, in which are kept a feed-box and a hydrant.

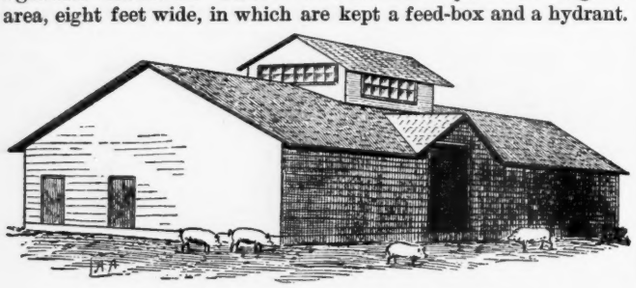


FIG. 1. PERSPECTIVE VIEW OF PIGGERY.

From this area direct access is obtained to every pen. The floor is divided by strong partitions, four feet high, into six pens of nearly equal size, all connecting by gates with the central area. Each one has a sleeping-place six feet square, divided off by a low partition only high enough to hold the bedding. The dotted lines represent two-by-six inch pieces spiked to the floor. If these are provided the occupants of the pens will keep their sleeping- and feed-rooms duly clean. The troughs for feed adjoin the side next to the central area. Over each trough is a hinged panel, which may be swung inward to fill the trough, and then brought out again when all is ready. The hydrant connects with a water supply which should have sufficient head to throw a stream through a hose to fill the feed-troughs and wash out the pens when desired. Each pen has an outer door opening into the yard, and a gate communicating with the central area. The latter furnish facilities for changing pigs from one pen to another without gates directly between the pens.

No estimate of cost is given, for it must depend wholly upon the style of construction and the local prices for materials. It may be

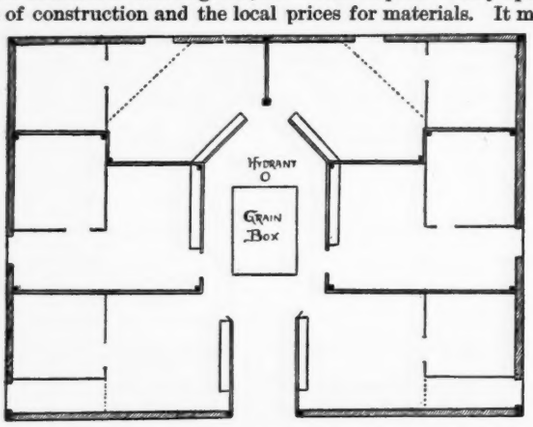


FIG. 2. FLOOR PLAN OF PIGGERY.

built very substantially upon stone foundation, with double boarding and building paper for the sides, shingle roof and paint. On the other hand the plan is quite as available for a cheap structure on cedar posts, with single sides of horizontal boarding and roof of similar material.

If desirable to use the loft for corn-cribs or storage purposes the frame must be made sufficiently heavy, and the roof of a sharper pitch, with an upper door at each end. A perspective view of the piggery is shown in Fig. 1, and plan of ground floor in Fig. 2.

Making Pork for Profit.—If pork is made for three cents per pound, there is a good deal of money in it. That it can be produced for this price is unquestionable, if the right methods are followed. There are a few indispensable requisites for it, but these are simple: clover for summer pasture; sweet corn for fall feeding; silage of clover or sweet corn for winter feeding; waste milk; a good breed of swine, and six to nine months' old pigs. Just now a farmer must use his wits to keep his chin above water. This is well for us, for any business that can be made profitable without thought, study, and economy, is apt to spoil a man, while obstacles in the path arouse determination and energy, which lead to success.

SAVE THE CORN FODDER.

The revised figures of the Illinois State Board of Agriculture show that, considering the grain alone as a source of income, the Illinois farmers suffered on their corn crop of 1889 such a per cent of loss as would ruin in two to three years the average city business enterprise. And this in the rich Prairie State, peculiarly well adapted to the production of corn. It is clear that if the Illinois farmers, with whom corn is a leading crop, would prosper and make any profit on that crop, they must utilize the stover. With most farmers the need of utilizing the stover is even more imperative.

Agriculture has reached the point where even on rich, cheap Western lands farmers can not throw away one-half of a crop and yet make a profit. The wasteful methods that have so long prevailed must be discarded. It is no longer a theory, but a condition, and a very serious one, that confronts us. It is not a matter of choice; it is a necessity. The potential feeding value of the stover of corn is very nearly equal to that of the grain. When that of both is realized, there is a profit in the crop. Corn stover is an excellent feed, and, if it is saved as dry fodder, it must be protected from the weather. It must not be fed by throwing it in the mud of the fence corner. When cut, moistened, and mixed with meal

IMPROVED FEEDING-TROUGH.

or bran, an excellent ration is formed. The cheapest and most effective way to save the corn fodder is to ensilage it. Silos of inexpensive material, and above ground, are even better than the excavation and stone wall, and laborious covering and weighting that were once thought necessary.

FEEDING TROUGH FOR CALVES.

The above illustration represents a simple and effective device for a manger in which to feed calves without the liability of allowing the strong to rob the weak. It is simply a low manger with a sloping board in the rear and a series of upright pieces, three or four feet high, nailed to the front at intervals of fifteen inches. The upper ends are rounded off so that no sharp angle is presented. Such an arrangement is equally useful for older cattle which run loose in their shed.

Ways of Weeds.—There are three classes of weeds, as to their duration, namely: Those that live for one season only, those remaining for two years, and a third and very large group, the members of which continue their existence indefinitely and are known as perennial plants. All these that belong to the first group are annuals, and it is evident that if these plants are kept from maturing their seeds there will be an end to them unless,—and here is the important point,—seeds are not sown with the crop, as is often the case, or they are brought in by the winds or other agencies for their transfer. Of course the soil may already be stocked with the seeds that remain dormant for many years until favorable conditions for their germination obtain. The biennials live for two years and the same rule as to seeding, or preventing their seed formation holds here as with the annuals. Perennial weeds, other things being equal, are the worst of all, for when they are once in the land they hold

their own and yearly produce a new crop of seeds if the chance is given them. They must be kept from yielding seed, and then if the plant itself is to be eradicated one of many methods may be observed. If large they may be pulled; if small keep the leaves cut off; but the best of all is to practice repeated tillage. Grow a hoed crop and not fail to hoe, hoe, hoe.

COCKER SPANIELS.

No other breed of dogs combines in a larger degree than the cocker spaniel the qualities of a household pet with those of a useful field dog. It is a handsome dog, with its fine form, speaking eyes, long, silky ears, and lustrous coat. As a breed it possesses an almost human intelligence, combined with a degree of unselfish and affectionate fidelity above what is expected from average human nature. Vivacious and sprightly as it is, the cocker is a very gentlemanly dog. Its form and movements, however lively, have a high-bred grace and appearance.

It is the smallest of the field spaniels, being medium in weight between the Clumber and the toy spaniels, and averaging from fourteen to eighteen pounds. There is in the breed a great variety of colors, comprising plain black, liver, black and tan, or one of those colors in combination with white. The coat is thick, fine and wavy, but not curled. The eyes are remarkably expressive, the ears long, thin, and covered with silky hair. The legs are strong and well feathered, the tail long and bushy, but it is usual to reduce its length about one-half with dogs employed in field-work, to avoid its becoming entangled in dense undergrowth. For field-work cockers are principally employed in hunting woodcock (whence the name), snipe, grouse, and quail. They may be trained to point, but this is unusual and scarcely desirable, as their small size renders it difficult to see them in the shubbery and herbage. The more common and, in fact, universal practice is to train the dogs to spring the birds at the proper time for the gun. The greatest difficulty encountered in training cockers for field-work is to hold in check their exuberance of spirits, and keep them from hunting on their own account, flushing the game prematurely, and rushing wildly at every bird as soon as it is brought down by the gun. But they are very intelligent, and with skill and patience on the part of the trainer soon learn to come to heel, "down" stanchly after a shot, and seek the dead game when ordered. No one, however, will claim that for general sporting purposes the cocker can be made as useful as the dogs of larger and distinctively hunting breeds.

OUR HOUSEHOLD PETS.

Apply Nitrogen to Get Starch.—In the experiments with potatoes at Rothamsted, England, it has been found that potash is one of the most essential ingredients required in the soil that it may produce a large crop. It is also shown that increasing the nitrogenous manures gives rise to a large increase in the starch stored in the potato, and it is chiefly for this end that the nitrogen-bearing manures are applied. Another point brought out by the chemical analyses of the tubers grown under different manures is that the juice (about eighty per cent) is richer in nitrogen where nitrogenous manures are used and the greater part of the nitrogen is always in the juice, and of course lost to the food in cooking. Diseased potatoes were found to contain less dry matter than healthy ones. The fungus, preying upon the tuber, extracts the starch and also uses up the nitrogenous substances in the juice. The richer the juice is in the nitrogenous substances the more favorable the conditions for the rot fungus. Therefore, potatoes grown with much nitrogenous manures would naturally be the most likely to undergo decay.

GROWING PORK FOR BACON.

B. W. JONES, VIRGINIA.

To have good bacon, we must first secure good pork of which to make it. It may be laid down as an incontrovertible truth that good pork can not be made of swill and slops alone. It is not by indiscriminate stuffing of an animal confined in a pen that sound pork is produced. Not by any sort of forcing process whatever, that converts a pig into a mass of spongy blubber, fit only for soap-grease, can good, sweet, solid pork be made, that will cure into good bacon and remain good through the heat of summer. It requires solid muscle, firm flesh, marbled by "a streak of lean and a streak of fat," to make ham and bacon such as we have in the country homes of Eastern Virginia and elsewhere. Not by a course of cramming, then, that lays on fat at the expense of muscle and flesh, is the right sort of pork made that one can transform into good, firm bacon. A growing hog needs exercise and should, as far as may be practicable, follow a natural life, and be allowed to develop into a natural animal. Not in a "four-square" pen, surrounded by mud and filth daily and all the time, can a pig enjoy those conditions that will enable it to form marbled flesh, that marks the golden mean between too much lean on the one hand, and too much blubber on the other. The pig likes to use its legs and its snout, and it should have room to indulge those instincts. Pigs that are growing for pork should, as the different crops of the farm will allow, have the range of a pasture, where they may have grass, and be permitted to glean the orchards and grain fields. Nor are the largest hogs the best for bacon. Hogs that are never wintered—spring pigs that go into pork at nine or ten months of age—are the cheapest and best for good bacon. It is even better to convert six months' pigs—those farrowed in June or July—into bacon in December than to keep them over another year.

If farmers would have rye and clover for the pigs in early spring and summer, and have orchards or nut-tree ranges where they could run when the fruit is falling, and sow field peas, or plant peanuts where the animals could glean in autumn, they would be enabled to raise pork at very small cost, and, with corn or meal to finish them off, would get meat that would be firm of flesh, marbled, and fit for the best of bacon. By this course, such slops as

from time to time accumulate in the kitchen and dairy house, with vegetables from the garden and truck patches, may be safely given them without detriment to the character of the pork or the lard. The point in growing pork is to avoid too much fat at the expense of muscle and flesh. By the above method the pig will be making muscle and bone the first six months of its life, and laying a good foundation for the formation of fat at the proper time.

Let pigs be farrowed in March or April, or far north in April or May; let them have free range on the rye and clover, or in the grass pasture, during May and June, be fed vegetables in July, and put into an orchard as soon as the falling fruit is fit for them. During all this time let them have just a little corn—a nubbin or so—daily, and then in September let them have a run on peas, and be permitted to glean the grain fields after the crops are removed. They will, other things being favorable, keep in sound health and condition, and be ready for an increase of fat in November, preparatory to pork-making in December. During the latter weeks of the hog's life the creature should have liberal, though not excessive, rations of good sound corn or meal, which, of all things else, is the best food in the world for solid pork, savory ham and bacon.

HOW TO APPLY MANURE PROFITABLY.

T. GREINER, NEW YORK.

On fields cropped with cereals and grazed by stock, the products of which, as milk and flesh are sold off the farm while a portion of the removed plant foods have been returned to the soil in the shape of barnyard manure, plain phosphates or superphosphates may do very well for a time. A 200-pound application puts on an acre from thirty-two to fifty pounds of phosphoric acid, or very much more than would be removed by a thirty-bushel crop of wheat, or a corresponding yield of other cereals. Consequently the phosphoric acid, if such applications are persisted in for any length of time, must accumulate in the soil, after a while restore the balance of mineral plant foods and at last result in an excess of the phosphoric acid. Then the phosphate application must necessarily cease to be effective. Potash, even if in small quantities, is continuously taken away, while the phosphoric acid is brought to the land in larger quantities than the grain crops remove. Thus potash will be deficient after a prolonged period of such treatment, and phosphoric acid be in excess. To make the soil again productive of the former yields we must supply it with potash, either by resorting to applications of barnyard manure or by the use of potash salts or unleached wood ashes. This also shows that a judicious rotation of stable manures and phosphates is most likely to preserve the proper balance of soil fertility on grain and stock farms.

The excess of phosphoric acid in the soil is increased very much if straw, hay, and fodder of any kind instead of being fed out on the place, manufactured into manure and returned to the soil, are sold off the place and the soil fertility is attempted to be kept intact by continued phosphate applications. A ton of good clover hay contains about thirteen pounds of phosphoric acid and forty-four pounds of nitrogen. Every ton of such hay removed from the farm has taken with it an amount of mineral plant-food which, to buy in the form of commercial fertilizers, would cost us perhaps more than $3.50. A ton of straw may have six pounds of phosphoric acid and twenty pounds of potash. If we sell a ton of wheat we give in it about $1.90 worth of mineral plant-food, and receive for it $25 or more. If we draw off a ton of wheat straw we take away in it $1.50 worth of mineral plant-food and get for it $5 or $6. Hence we make a much better bargain by selling the grain than the straw. Selling straw, hay, etc., removes the potash from the soil three or four times as rapidly as it does phosphoric acid, and the land, when not unusually well supplied with it, will soon be suffering for the want of it. In such a case the applications of phosphates often so effective on grain farms will not be sufficient. Here we will probably need both mineral plant foods, potash and phosphoric acid, or perhaps even potash alone. The marketing of grain, straw and hay involves the removal of both minerals from the soil at almost an even rate; and to insure good results from the application of fertilizers both minerals are needed. For permanent meadows potash may be required first, and phosphoric acid only in the second place.

We have still to bear in mind that on the majority of farms potatoes and root crops are also grown in rotation with cereals. These crops also draw more largely on the potash supply than on phosphoric acid. What part of these crops is fed out on the place to sheep, cows, hogs, etc., sends its potash back to the soil and removes only most of the phosphoric acid, but whatever of these crops is sold (as is largely done in case of potatoes) takes the potash along at the rate of about eleven or twelve pounds of potash to the ton of tubers. Consequently potato culture will help to reduce the potash supply of the soil very materially, perhaps at the rate of one hundred pounds per acre every year. The amount of plant-food that has gone into the tops need not be considered, as it is saved to the soil by the decay of the tops left on the ground. Tobacco growing, if continued, is death to the soil. It has ruined many of Virginia's fine farms by robbing them, much faster than any other ordinary crop could have done, of potash, just the substance most difficult to replace.

Now the farmer who has managed his farm for many years and knows all the particular circumstances, how every field has been handled, what has been sold off, whether grain exclusively, or grain and hay and straw and potatoes, or whether hay alone, and what has been returned in the shape of manures, can thereby be guided in the selection of fertilizers. The more the grain crops have preponderated in the sales of the farm, the more likely it is that phosphates alone will restore the productiveness of the soil; and the more the other crops have been grown and sold off, the more likely will potash be needed, alone or with phosphoric acid, in order to give the former good yields.

This same line of inquiry might be further extended to garden and fruit crops; but I will content myself with the statement that potash is the most important element in the make-up of all fruits, and especially tree fruits, and that no other single substance of plant food is so essential or its application so certain of excellent results. Potash in almost any form is a special orchard fertilizer.

NITROGEN—ITS CHEAPEST SOURCE.

JAMES H. WHITE, FLORIDA.

A good sample of decorticated cotton-seed meal contains 136 pounds of nitrogen, 64 pounds of phosphoric acid, and 40 pounds of potash. A good sample of nitrate of soda contains 320 pounds of nitrogen, but neither potash nor phosphoric acid. Its whole cost is chargeable to the nitrogen; but in the cotton-seed meal we have other values besides the nitrogen.

For the purpose of comparison, we will first charge the whole cost of each to the nitrogen alone. Nitrate of soda is quoted in Jacksonville, Florida, at $60 per ton. Cost of the nitrogen therein 18.7 cents per pound. Cotton-seed meal $24 per ton. If it contained no other valuable material, the nitrogen would cost only 17.6 cents per pound. But cotton-seed meal has other values—

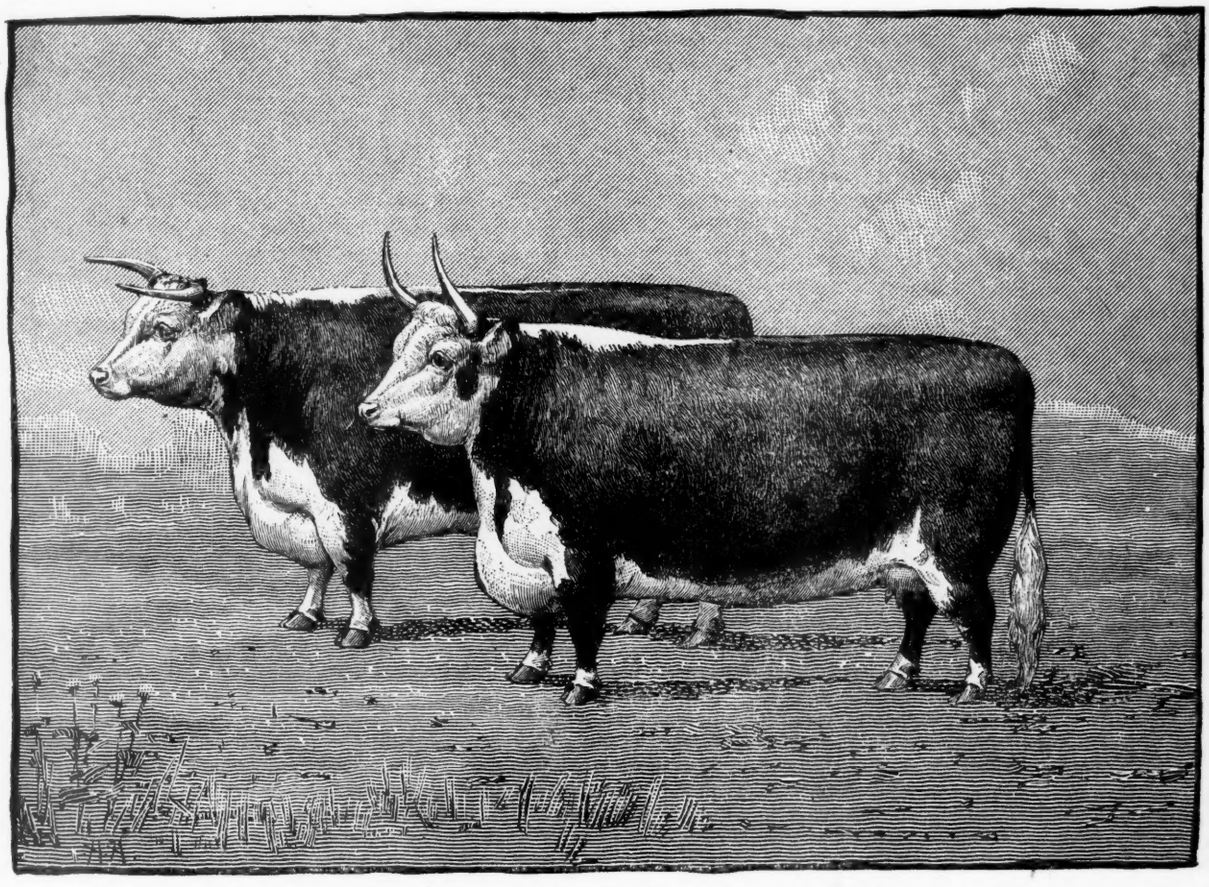
64 pounds phosphoric acid at 12½ cents per lb	$8.00
40 pounds potash at 5 cents per lb	2.00
	$10.00

If then we charge the nitrogen in the cotton-seed meal with only its own proportion of the cost, we have the nitrogen therein at 10.3 cents per pound. Whatever difference there may be between Jacksonville and New York values, the fact still remains that cotton-seed meal is a very cheap source of nitrogen as well as a cheap manure. While it contains all the valuable ingredients of a fertilizer, they are not in suitable proportion, hence the necessity of supplying the deficiency from other sources. For this purpose I mix equal parts by weight with a prepared fertilizer that is very rich in phosphoric acid and potash, that gives a compound with 5½ per cent of ammonia, 6½ per cent of phosphoric acid, and 7 per cent of potash. This makes a high grade fertilizer at a moderate price. It makes a first-class pine-apple fertilizer, and is excellent for all growing trees, vines, and plants, but has too much ammonia for fruiting orange trees and grapevines.

Handling Seed-Clover.—It is a mistake to put seed-clover in the barn. Hulling the clover makes a dust so very fine and penetrating, that, in spite of all that can be done, the barn will be sadly fouled. On this account the workmen find their work almost unendurable if it must be done where the air is in the least confined. The better place for hulling is in the center of the field on which the haulm may be applied directly, or after a short compost. Seed-clover may be kept in good condition in barracks. These may be inexpensive, and of a temporary character. The clover itself will go far toward supporting the upright timbers, which need not be set in the ground, but need be only well braced together. Fencing boards securely nailed will answer for braces. The roof may be of boards, lapped. The sides need be inclosed only half-way down from the roof. The boards can be knocked off before the hulling begins, and of course are put on after the seed-clover is put in the barracks.

HEREFORD CATTLE.

None of our popular breeds of cattle have encountered more fluctuating fortunes than the Herefords. The first importation of which there is any record was made in 1817 by Henry Clay, the great statesman. But they were lost and left no mark in the tide of popularity which set toward the Shorthorns. It was not until 1840 that the next considerable importations were made. The direct descendants of some Herefords brought to this country that and the following years are still bred unalloyed in the State of New York. Ten years later several pure-bred Herefords were brought from England to Ohio. But these and other scattered American herds, and the fine herd of F. W. Stone, in Canada, bred from importations made in 1860, failed to find general favor with American breeders. The Shorthorns had won such a degree of popularity as for a time to overshadow all other cattle. Many American herds of that princely race were then as now the peers of any in the world,



HEREFORD COWS LUNA AND MABELLE.

and animals were sold at great prices to English breeders to be carried back to the native habitat of the breed. Meantime, however, the Herefords were not wholly neglected. A few breeders clung loyally to their white-faced herds, and stout champions were ready to enter the lists in their behalf. The foremost one of these was Mr. William H. Sotham, who, in a communication to the AMERICAN AGRICULTURIST of July, 1843, boldly challenged comparison between the Herefords and the Shorthorns. In his subsequent championship of the white-faces he was ably seconded by T. L. Miller, Frederick William Stone, Adams Earl, and other noted breeders.

At length their hour of triumph came. Forty years after Mr. Sotham had thrown down his gage in behalf of the breed, a Hereford steer won the champion prize for the best dressed carcass of any breed, at the Chicago fat-stock show. The next year the Hereford bull Lord Wilton sold at auction in England for $20,000. These events gave additional impulse to the current which had already set in toward the Herefords, and aided in securing for them the recognition which had long been withheld. They now have an established and well-defined position among the great beef breeds of the country.

The Herefords are well adapted both for grazing and stall feeding. On the plains and ranges beyond the Mississippi they have proved eminently successful, both as full-bloods, and for crossing on the "native" cattle. In the great corn belt they respond quickly to generous feeding. As to the comparative merits of the Herefords and Shorthorns, Hon. Henry Clay, the first importer of the former, wrote as follows: "My opinion is that the Herefords make better work cattle, are hardier, and will, upon being fattened, take themselves to market better than their rivals. They are also fair milkers. On the other hand, the Durhams, I think, have the advantage in early maturity, in beauty, and in the quantity of milk which they will yield. They will also attain great size and weight even. The choice between the two races should be regulated somewhat by circumstances. If one has rich, long, luxuriant grass, affording a good bite, and has not too far to drive to market, he had better breed the Durhams, otherwise the Herefords." This was eminently just and true at the time, but the changes of seventy years have somewhat modified the circumstances. American breeders have aimed so exclusively to beef production as to breed out, to a large extent, the milking qualities of both races; and railroads have become so plentiful that beeves no longer have to "take themselves to market." Furthermore the Herefords are not behind any other breed in early maturity. In fact, there is no longer any unfriendly rivalry between the breeds. Each one has its own excellences and both have become thoroughly well established in American husbandry.

In England the Herefords have been subject to equal fluctuations as in this country. Though mainly a local breed there, it was the most fashionable one in the United Kingdom a hundred years ago. The *Live Stock Journal* of London says: "From the year 1799 to 1834 Hereford oxen had taken eighty-eight premiums at the London fat-stock show—more than double that of any other breed of cattle gained in the same period." But their popularity in England declined and reached its lowest point about 1840, when the first permanent importations were made to the United States. After a long period of depression, the Hereford interest is once more permanently established in the native land of the breed. The large price realized for Lord Wilton helped some, and at the Paris Expo-

sition of 1889 a herd of Herefords exhibited by Mr. Fenn was awarded the grand sweepstake prize for the best cattle of any breed. One of the successful breeders of Hereford cattle is Queen Victoria, portraits of whose cows Luna and Mabelle are shown herewith.

THE POINTS OF A DAIRY COW.

WEBB DONNELL, MAINE.

The practical dairyman has small concern for fancy markings. The points of a dairy cow in which he is interested are those characteristics which usually accompany excellence at the pail. It is a mistake to suppose a "cow is a cow," whatever her form or characteristics. Many are fit only for the butcher's block. While it sometimes happens that a cow having all the marks that indicate excellence fails to fulfill expectations, yet the exception proves the rule. This non-fulfillment of promise may be due to organic or functional derangement or to undevelopment of the lacteal organs during growth, owing to insufficient nutrition,—a matter that should be borne in mind by those who are raising heifers. In buying a cow for dairy purposes, and depending largely on external appearances in making a selection, it is wise to place the greatest stress on the udder, the paunch, and the appetite of the animal. There should be a well-developed udder if a large quantity of milk is to be secreted. The teats should be set well apart and generous in size. If a cow is to give large quantities of milk or butter she must be a hearty feeder. She can not convert small quantities of food into large quantities of dairy products. The dainty feeder will give very dainty returns indeed. A large body is a fitting accompaniment to a vigorous appetite. This is the factory where grass, hay, and grain are turned to butter, and the accommodations must be ample if large returns are expected. The dairy cow should, in general terms, have a refined, feminine look, the skin should be mellow and pliable when rolled up by the hand. A wedge-shaped form, thin neck, and small head are the natural characteristics of animals that are valuable, since in their case superfluous bone, muscle, and tissue are placed where they will do the most good,—farther back where the feed is being converted into milk and butter. Size of "milk veins," a golden color in the skin, and waxy horns are points well worth noting, but of more importance is the disposition, which should be gentle and not easily becoming irritable. These are traits that should belong to the dairyman himself as well as to his cows, but when they are common to both, with other conditions favoring, it is certainly not unreasonable to look for success.

CARE OF MILK.

GEO. E. NEWELL, NEW YORK.

A cheese manufacturer in this State has had the following pointed advice printed at the head of the dividend-sheets he issues to his patrons: "Take good care of your night's milk, it will pay you." Where milk is delivered at the factory only once in twenty-four hours, more than ordinary attention at the dairyman's hands is necessary to preserve its quality. Especially is this true in hot weather, and on nights when the air is disturbed by electrical storms. It is of vital interest to the manufacturer to always receive good milk, for the reputation of his stock must be maintained, and profitable money returns yielded to his patrons. Of deeper significance also is the public health, which may be jeopardized as greatly through carelessness and ignorance in the dairy as by loose sanitary conditions in the face of a pestilence. The thought of eating "hurt meat" fills every one with abhorrence, yet the consumption of tainted milk is as dangerous to human health. Milk may develop a fatal poison, and yet reveal little of it to the sense of smell. There are two general species of taint that affect milk. When warm from the udder and lying in a deep vessel it generates one character of decomposition, and rank odors emanating from decaying animal or vegetable matter cause the other. To avoid both, milk must be set in a draught of pure air, and be aerated thoroughly by stirring, or by driving air through the mass. The fluid should not be violently handled while it is cooling and airing, or a partial separation of the butter globules ensues. In whatever character of vessel milk is stored over night, the material of course being tin, free circulation of air should be secured under the bottom as well as around the sides. Cans of large diameter should be employed, and only a moderate quantity of milk be stored in a can. For a dairyman who regularly patronizes a cheese factory and makes a day delivery of milk once a day, a properly constructed cooling stand should be a part of his equipment. It should stand on an elevated location convenient to the milking barn, and one open to a free circulation of air from all quarters. Posts are set on ten feet high with a shingled roof, and a floor as high above the ground as a wagon box. This will make a structure that the wind can not blow down, and it will be rain-proof unless from a driving storm. A low roof, or boarded-up sides should be avoided as the object is to offer no obstruction to the freest aerial circulation. The cans of milk should rest on cleats raised at least six inches above the floor, and they never should in any case be covered over night unless by a screen. A flight of strong steps should lead up to the platform for the use of milkers, and the opposite side face a driveway for facility in loading on a wagon. Milk thoroughly freed from the animal heat before it is massed in bulk is quite certain of keeping sweetly till morning.

It is a good practice to have plenty of pails, and let the milk stand in them an hour or more before storing it in greater bulk. Not over one hundred pounds should be kept in one can, and the greater the diameter of the can the better. Don't put sour whey in milk cans, but rather take a barrel to the factory for that purpose. After a thorough cleansing of the receptacles, they should be treated to a rigid scalding with boiling water. This may seem an unnecessary precaution; it is often neglected to the detriment of the milk.

Taint in milk can not always be detected by the sense of smell, and it presents its most dangerous character when, odorless in the lacteal fluid, it arises as gaseous effluvia from the cooking cheese.

HOW TO INCREASE THE MANURE PILE.

D. Z. EVANS, JR.

Farmers do not always give as much attention to increasing the size of the manure pile as they might. There are the pig pens, and most of them are wet and filthy, the pigs naturally being in the same condition. There is always plenty of chaff or waste material of one kind or another around the barns or stables, and this can be liberally supplied. When this runs out leaves can be hauled from the woods during off days, put into a near-by shed, and used as needed. If the farm is near a river, the rushes and dry grass which come ashore in quantities in many places can be hauled up, and make excellent bedding and manure. In this way the writer has managed to keep his men and teams busy when there was little else to do. The pigs were always comfortable and clean, and large quantities of manure were made, generally getting from three or four large pig pens fifty to sixty loads of fine manure. There was at all times enough dry material to absorb the liquid matter, and thus prevent much value from running down the drains to be entirely lost and to make a nuisance around the pens. The barn-yard sloped toward the center, making quite a large and wide place for the liquid manure from the stables and barn-yard to collect in. Here were deposited considerable quantities, from time to time, of waste corn stalks, leaves from the woods, rushes and dry grass from the river, and any other waste, absorbent materials. The leaves and dried rushes were also used for bedding for the horses and cattle; nothing was better or cheaper; the stables were always clean and free from wet, slush, and dampness. On the farm were neat, roomy, and comfortable hen-houses, in which the poultry was housed every night and not permitted to roost on trees, wagons, plows, and other implements in the sheds. By cleaning out the hen-houses every month, and keeping the floors well sanded, several barrels of good manure were secured, which made the corn fairly jump when applied to it in the spring. This manure was kept in barrels, under cover, in the best possible condition for applying to corn, onions, or other crops.

Mangers.—Fixed or permanent mangers as a general rule save time and labor in feeding stock. All animals should have low mangers, otherwise the muscles of the neck become stiff or contracted by the non-use of natural exercise. This is most readily observable in race horses and stallions which are confined in stalls. For such, a tub or box should be used and removed from the stall immediately after feeding. But the special advantage of a movable feed trough is found in the case of animals which have a discharge from the nostrils, as the soiled feed vessels can be more readily and completely cleansed. Horses long confined in the cities, whose working lives are spent in severe confinement in cramped stalls with high hay-racks and feed-boxes, when from lameness or injury are sent in the country to pasture for recovery or recuperation, suffer severe pain in grazing. If this is not soon discovered, the horse is returned to the owner in a half-starved condition, and the poor beast is a fit subject for the society for the prevention of cruelty to animals.

LIVE-STOCK IN CALIFORNIA.

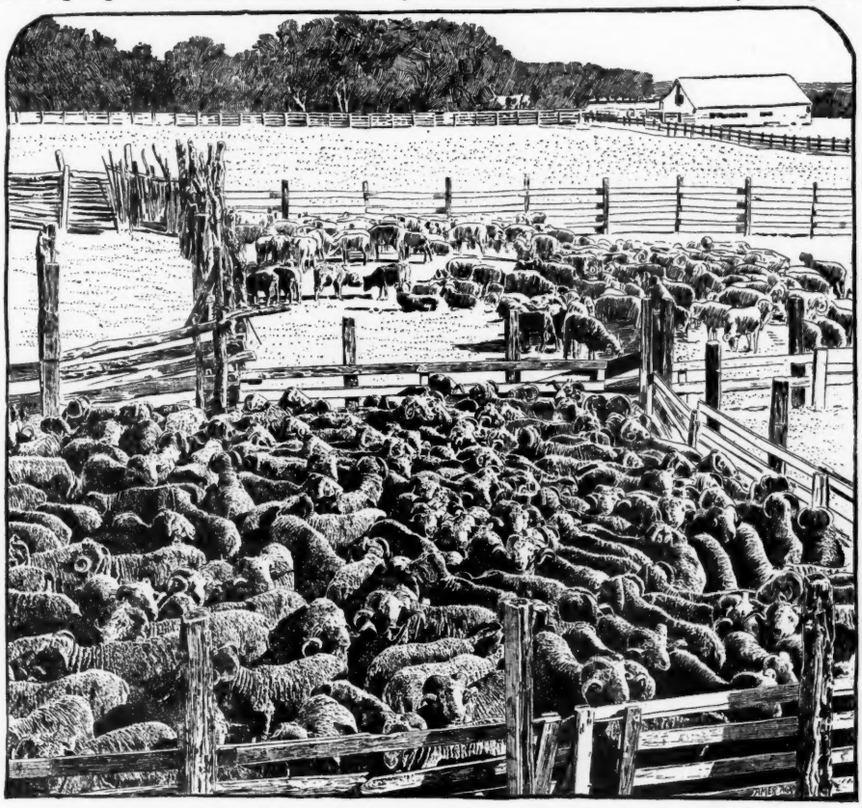
CHARLES H. SHINN.

In these days, when California is so rapidly urging forward orchard and vineyard planting, one is apt to forget that the live-stock interest of the State began in the first days of the history of the Spanish province of Alta California, and that it has been increasing ever since. Millions of acres of land on the Pacific Coast, as in all mountainous countries, are purely pastoral. Some of the best known of the Spanish cattle-ranges are now famous for their thoroughbred cattle and horses. Over and over again the names of the great ranches of nearly a century ago come to the front as modern breeding establishments, dairies or cattle farms devoted to one or another specialty. Every breed of cattle known in the United States is represented by some of its best strains in California. Some of the best of the running and trotting stock of America is also here. The man of the Pacific Coast believes in his heart that better strains of live-stock than the world ever saw are being developed in Washington, Oregon, California, Nevada, and northern Arizona. Where else can be found such a sweep of pastures from seashore to snowy mountains, such valleys, foothills, uplands and mesas, such a variety of native and cultivated grasses and forage plants, and such a range of climate, oceanic or continental, as the stock-raiser can choose anywhere between semi-tropic Los Angeles and the fir-clad islands of Puget Sound? The Spanish horses, the Spanish cattle, and the small Mexican sheep have long ago disappeared so completely that only a trace is left in the frontier counties. As in the Rocky mountain ranges, it has paid to "breed up," and this has been accomplished with great rapidity. Cattle have always been profitable, but fine horses were less so until within the past decade. California claims especial advantages for producing the better classes of graded and thoroughbred live-stock of every sort, but while her cattle and horse interests have steadily increased, the sheep industry has remained for years almost stationary. California can hardly be called a "corn-country," as yet, less than a hundred thousand acres being the average planting of the State. The number of hogs grown has been determined by the dairies and beet-sugar factories whose waste can be used for their feed, and by the ordinary local demand, little or no "hog-products" being exported. It is still an open question whether California pork is "fit for packing," but if so, the production can be almost indefinitely increased, as an immense area of land is suitable under irrigation to the growth of the very finest of corn. In Kern, Tulare, and Fresno alone, not less than two million acres of land could be planted, besides the present acreage of alfalfa.

The live-stock interests of California can best be shown by a few statistics from the Assessor's Report for the year 1888. In that year were reported 1,264 thoroughbred horses; 87,406 graded horses; 122,773 American horses; 70,792 common horses, and 84,492 colts. Of horned stock there 14,882 head of beef cattle; 517,165 head of ordinary stock; 186,682 head of calves. Dairy cows were reported as follows: thoroughbreds, 2,549; American, 134,088; graded, 61,142; common, 52,542. There 3,141 head of oxen. The hogs numbered 244,620. Of mules 36,589 were reported, and of jacks and jennies, 1,131. Imported sheep numbered 4,933, graded 314,868, common 2,315,269, and lambs, 307,440. Common goats are reported at 54,449, with 864 Angoras.

A great deal is said in the newspapers these days about the new racing stables of California. They represent large investments, and have done more to attract attention to the advantages of the Coast for live-stock breeders than all other causes put together. Nevertheless the claims of California as a "horse country" rest more on the high average than on the records of a few trotters and thoroughbreds. Only half a dozen counties yet contain large and famous racing establishments, but nearly every county in the State has soil, climate, and natural grasses to produce very fine horses. The plainest farmer can keep good animals in every class, and, as a fact, the grade of the California roadster is surprisingly high. I have visited nearly every District Fair in the State, and have observed that the love of good horses is universal.

A visitor to California too seldom gets away from the railroad tracks. The foothills of every county have extensive and well-watered ranges used for cattle, horses or sheep. As summer advances the flocks and herds are driven to the mountain pastures. The larger part of the valley live-stock remains on the same farms the year round. By the time the pasturage grows scanty, the stubble fields and straw piles are ready, and before these are exhausted the first rains bring the fresh grass. In thousands of cases, along the great valley "bottoms" the pastures extend into willow and tule expanses, moist all the year and full of wild grasses. Here are "natural dairies" all along the margins of tide and fresh-water sloughs — dairies whose value is constantly increasing. On the lines of irrigation canals, and in the artesian-well districts, alfalfa, white clover, and many other forage plants are grown over extensive areas. Cottonwood, poplar, and willow trees are planted for shelter, and so some of the features of the Belgian lowlands are being reproduced. The most notable illustrations of this are in the Kern country.



A CALIFORNIA FLOCK OF RAMS AND THEIR CORRALS.

The foothills, especially of the Coast Range, and the smaller valleys are more and more devoted to horses and fine cattle, except where the fruit and grape industries have been established, and even there many farms have superior facilities for raising live-stock. Out of about fifty farms that have won a deserved reputation in various departments of stock-breeding about three-fourths are in the Coast or Bay counties, though the Sierra-foothill farms promise equally good results. It is curious to see how well these farms are scattered over the State from Los Angeles to Siskiyou. Alameda, San Mateo, Santa Clara, and all the central counties have farmers who are investing in better stock; it is the same north, clear to Lake and Humboldt, and south through Santa Barbara and Ventura. The number of reputable breeding establishments, especially in blooded cattle, has greatly increased in the last ten years, and one often hears the remark from men who know the business that "California breeding farms are second to none in the country."

The accompanying engraving shows a flock of rams in their

corrals. Of late years some of the amateur photographers are leaving pure landscape, and make charming "studies" of horses, cattle, and sheep. Some of these days California ought to have great horse and cattle painters, for nowhere else are there finer opportunities.

INFLUENCE OF SEASON ON THE PRODUCE OF WHEAT.

J. J. WILLIS, SUPERINTENDENT SIR J. B. LAWES'S EXPERIMENTAL FARM, ROTHAMSTED, ENGLAND.

It is proverbial that the weather exerts a very powerful influence on the produce of our fields, and every one engaged in farming knows, after he has expended his time and money upon the land, that the growth of his crops is dependent upon the sunshine and the shower. Still the treatment of land in common practice is not so uniform as to enable any one to measure the influence of climate upon any particular crop. To do this the crop must be grown continuously upon the same land, and no change must be made in the manures applied.

In a field at Rothamsted, to which reference has on several occasions been made in these pages, in which wheat has been grown on some plats without manure, and on others with different descriptions of manure for forty-six successive years (1844 to 1889 inclusive) the tillage operations having been, as far as the seasons would allow, the same year after year, the essential conditions for comparing the productive character of one season with that of another are perhaps better fulfilled than in the case of most records of ordinary farm practice. Unfortunately, none of the plats have been dressed with exactly the same description and quantity of manure every year since the commencement in 1844, excepting the one with barn-yard manure,—and, owing to the great accumulation of almost every important ingredient that must take place within the soil when a large quantity of this organic manure is annually employed, it is obvious that the difference in the amount of produce yielded by it year after year can not be taken as simply due to the comparative effects of the different seasons. Most of the plats have, however, been supplied with artificial mineral manures alone, or these in combination with ammonium-salts, or nitrate of soda, without any material change in the description or the amount employed for the last thirty-six years, and as there is sufficient evidence that the effect of these manures upon the wheat crop of the succeeding year is comparatively limited, we can fairly calculate what is the influence of season in any one year upon the produce of our wheat fields.

Many years ago it was stated by Messrs. Lawes and Gilbert as the result of the experiments at Rothamsted, now under consideration, as far as they had then proceeded, that the farmer might assume for practical purposes that he would, on the average of seasons, get one bushel of increased produce of wheat with its proportion of straw for every five pounds of nitrogen applied as manure for the crop, provided the soil was not deficient in the necessary mineral constituents. The truth of this statement has fully been borne out by subsequent investigations.

On one of the experimental plats a complex mineral manure has been applied every year for the last thirty-six years, and on another the same mineral manure with an amount of ammonium-salts containing forty-three pounds of nitrogen has been annually applied. The average annual produce of wheat over the last thirty-six years has been as follows:—

	Bushels.
With mineral manure and forty-three pounds of nitrogen	24
With mineral manure alone	15½
Increase by the use of forty-three pounds nitrogen	8½

Taking the average of these years, therefore, we have in the foregoing experiment an increase of 1.03 bushel of wheat with its proportion of straw for every five pounds of nitrogen applied as manure.

We propose, then, to consider this as the yield in a season of average productiveness; and adopting this standard, to consider a season "*good*" or "*bad*" in proportion as it gives more or less increase than one bushel of wheat and its proportion of straw for every five pounds of nitrogen used as manure. In 1889, the same mixture of mineral manure and ammonium-salts gave a produce of twenty-three bushels of wheat, or an increase of seven and seven-eighths bushels over the average produce with the mineral manure alone. In this experiment, therefore, five pounds of nitrogen has given in the season just past an increase of just under a bushel of wheat, and its proportion of straw. On two other plats receiving the same mineral manure, but with the large amount of eighty-six pounds of nitrogen annually; on one plat in the form of ammonium-salts, and on the other as nitrate of soda, the average result of wheat grain over the last thirty-six years has been as follows:

	As Ammonia. Bush.	As Nitrate. Bush.
With mineral manure and eighty-six pounds of nitrogen	32⅜	36
With mineral manure alone	15½	15⅝
Increase by the use of eighty-six pounds nitrogen	17⅞	20⅜

There is then, even with these comparatively heavy dressings of artificial manure, an average of 1.02 bushel, and 1.21 bushel, respectively, increase of wheat and its proportion of straw for every five pounds of nitrogen employed as manure. During the forty-six years that have elapsed since the commencement of the continuous wheat crop at Rothamsted, it is probable that there have been experienced fluctuations of season as great as are likely to occur in any similar period. Accordingly we find 1863 was the year of greatest yield of wheat and 1879 the worst.

In 1863 a mixture of mineral manure and eighty-six pounds of nitrogen in the form of ammonium-salts gave a produce of 53⅝ bushels of wheat, and the same description of minerals with eighty-six pounds of nitrogen as nitrate of soda gave 55⅝ bushels of wheat, being an increase of 38½ and 40½ bushels respectively over the average produce with the minerals alone; that is more than 160 per cent over the average result, and about 400 per cent over that of the worst season of the forty-six, namely, 1879.

In a recent article by Sir J. B. Lawes on the English wheat crop of 1889, he says taking the mean produce at Rothamsted, of the unmanured plat, of the dunged plat, and of three artificially-manured plats reckoned as one, these selected plats gave an average produce in the season of 1889 of 28½ bushels at 59⅝ pounds per bushel; or adopting the standard weight of sixty-one pounds per bushel, the average yield is 27½ bushels or half-a-bushel below the general average of the United Kingdom, which is reckoned to be twenty-eight bushels at sixty-one pounds per bushel. The area under the crop in the United Kingdom for 1880 is returned at 2,540,720 acres. Taking this area and a yield of 27½ bushels per acre, the gross produce will be about 8¾ million quarters of wheat, and deducting two bushels per acre for seed on the same area, the home produce available for consumption will amount to a little over eight million quarters. Taking the population for the current harvest year, rather over thirty-eight millions, the amount of wheat required for consumption at 5.65 bushels per head will be nearly twenty-seven million quarters; and deducting from this the quantity available from the home crop there remains nearly nineteen million quarters of wheat to be provided by stocks and foreign imports.

The Barley Crop.—Barley has been grown heretofore solely for malting for the brewers; and its feeding qualities have been wholly ignored. Yet some years ago this grain was the common food for horses, and when ground into meal was used with waste milk and boiled potatoes for feeding pigs, and made the very best pork. The prejudice against the culture of barley, common among farmers, is, no doubt, due to the necessity for the thorough cultivation, which takes the head and hands more than is agreeable to them. But the times demand a great shaking up of dry bones, and one must put his hand to the plow in earnest if he will succeed in making the farm pay just now, and barley is a good crop to grow for feeding, if not for sale. Good barley brings sixty to seventy cents per bushel in New York, which is fifty per cent more than corn. Fifty bushels per acre may be grown with the right cultivation. The tillage of the land is the main point. Weeds and clods will not do. Clean land, thoroughly mellowed, and in good heart, will produce a full crop, and this is best for the land, as well as for the crop. We need better tillage, and, as there must be an incentive for every good act, so we should choose those crops which force us to till the soil perfectly.

To Raise Turnips Cheaply.—As soon as the wheat is off plow the land, harrow thoroughly. Sow broadcast one pound of seed to the acre, and go over it with a heavy roller. It is important to sow immediately after harrowing the land, and if the roller is light and can not be weighted down, go over twice. When the turnips are large enough to hoe take the cultivator, set the shovels one foot apart and go through them; or better set cultivator shovels into a long stick like a corn marker, one foot apart. At the end of eight or ten days go through the turnips again crossways and they are as good as hoed. It is easy to raise from one hundred to three hundred bushels to the acre if the land is in good order. If not, put ten to fifteen bushels of hen manure on before harrowing. J. G. QUIRIN, N. Y.

THE ROSE LEAF-HOPPER.

DR. CLARENCE M. WEED, OHIO EXPERIMENT STATION.

The leaf-hoppers form a large and interesting family of the true bugs. They are especially distinguished by the long third joints of the hind legs, which are curved and armed with a row of spines on each margin. These long legs enable them to leap rapidly and some distance, a fact to which their common name of leaf-hopper is due. Nearly all of them are small and slender insects with blunt or pointed heads of the shape shown at Fig. 2. They feed upon a large number of plants, being especially abundant upon the grasses of pastures and meadows, where they frequently rise in swarms as one walks along. Professor Herbert Osborn has lately estimated, after a careful study of the subject, that one-half of the available nutriment from pastures often goes down the throats of these little pests. Probably no leaf-hopper attracts more general attention the country over than the one infesting rose bushes. Nearly half a century ago Dr. Harris wrote: "There is a little leaf-hopper that lives upon the leaves of rose bushes and is very injurious to them. In its perfect state it is rather less than three-twentieths of an inch long. Its body is yellowish white, its wing covers and wings are white and transparent, and its eyes, claws and piercer brown. The male has two recurved appendages at the tip of its hind body. Swarms of these insects may be found in various stages of growth on the leaves of the rose bush through the greater part of summer and even in winter upon housed plants. Their numerous cast skins may be seen adhering to the under side of the leaves. They pair and lay their eggs about the middle of June, and they probably live through the winter in the perfect state concealed under fallen leaves and rubbish on the surface of the ground." The nymph or pupa of the rose leaf-hopper is shown somewhat magnified at Fig. 1, while the adult, also enlarged, is shown at Fig. 2. The back of the pupa is protected by numerous, elongate, spinose hairs. The injury to the leaf is manifested by the appearance of numerous white specks on its upper surface. This pest is easily destroyed in its immature stages by pyrethrum, kerosene emulsion, or some form of tobacco.

FIG. 1. THE PUPA.

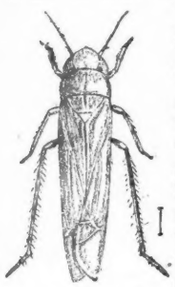


FIG. 2. THE PERFECT INSECT.

PEANUTS; THEIR GROWTH AND CULTURE.

J. S. FOWLER, VIRGINIA.

The so-called "peanut belt" of this country includes a part of the States of Virginia, North Carolina, and Tennessee. Within those limits the peanut is the principal money crop, and in fact there are few farm crops grown, in any part of the United States, that excel it in value per acre.

The first requisite for a crop is good seed. All the nuts retained for that purpose must be kept perfectly dry through the winter, as dampness and fermentation would destroy their germinating power. During wet days, and evenings in early spring, the farmer and his family are engaged in preparing the seed for planting. Every shell must be opened and the seed extracted. This is termed "popping," and popping-bees, to which the neighbors are invited, are frequent. There fun and frolic are rife, as in the corn-huskings and apple-parings of the more northern States. The cracking of the nuts, and of harmless jokes echo from the walls of many an humble cabin. The seed peanuts are all carefully hand-picked, and all light colored, shrunken, or defective ones rejected, only the plump, perfect peas, with unbroken skins, being kept for seed. The rejected ones are sold for roasting.

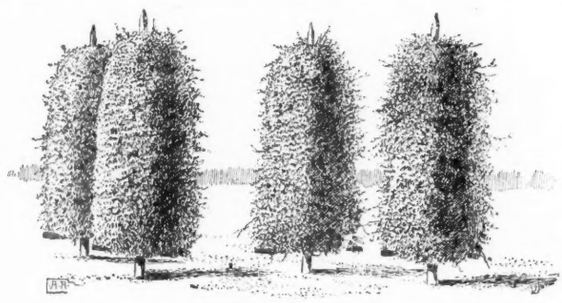


FIG. 2. PEANUT STACKS.

The planting was formerly done by hand in a very tedious and laborious manner. But it is now performed by means of a machine, with which one man can plant six to eight acres per day, in a very superior manner. Though the shelled peanut is nearly the same in size and form as a bean, the same implement can not be used in planting both. The slightest cracking of the thin pink skin would spoil the peanut for purposes of seed. The peanut-planter is very ingeniously constructed to pick up the peas, deposit them at regular intervals in the row, and press the soil down upon them without abrading the tender film in which they are enveloped. Five pecks or twenty pounds of shelled seed are required for an acre. The peanut planting time is from the middle of May to the middle of June. The most critical time for the crop comes immediately after planting. If the weather is too wet, the seed rots in the ground; if too dry, it withers and perishes. Then the newly planted seed is subject to the depredations of nearly every kind of bird and small animal which inhabits the region. Moles often make great havoc. In nearly all cases more or less of replanting is necessary.

A field of peanuts just sprouting out of the ground is a very pretty sight. The growth is upright until the plant has attained a height of eight or ten inches, then the pea-shaped yellow blossoms appear, and the plant falls over and makes its subsequent growth in a procumbent position. A singular process now ensues. As the petals of the flowers fade and fall, the legumes or pods are forced into the soil, there to complete their growth, and ripen the inclosed seeds, as shown in Fig. 1.

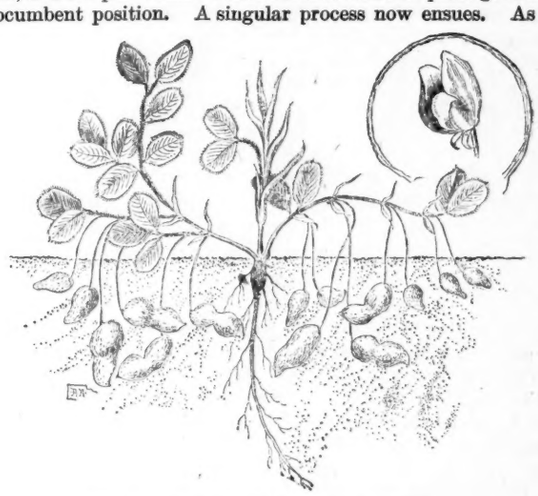


FIG. 1. PEANUT PLANT AND FLOWER.

The culture consists in going frequently between the rows with a small plow of peculiar shape. If grass or weeds appear in the rows (all weed growth is called grass in the South) they are cut out with hoes. But after the plants have fallen over, they cover the earth so thickly as to smother out the weeds. A single tap-root, which penetrates the earth deeply, like that of the allied red clover, is the main root growth of the peanut plant, of which the scientific name is *Arachis hypogœa*.

It is the aim of the peanut grower to have the crop mature about the time of the first frost of autumn. The pods must be lifted from their earthy beds to keep them free from stains. A plow is run under each row, cutting off the main roots and throwing out the pods which adhere to the branches. After they have lain on the ground until partially dried, the whole are stacked in the field. Stout stakes are cut in the forest, the large end sharpened, short strips nailed across them near the sharpened end, and they are then driven into the ground in rows at convenient intervals through the field. The gathered plants are stacked around these stakes, the cross-strips being designed to keep them from contact with the ground. Each stack is seven to eight feet high and three to five feet in diameter. Fig 2 shows a group of them.

The stacks are sometimes hauled to the barn for the purpose of picking the pods; but it is generally done in the field during the autumn and winter. The pickers build small fires, around which they gather, picking off the nuts and sorting the well-filled ones from the "pops" as the partially empty pods are called. Efforts have been made to devise machinery for picking the nuts from the

vine; but without success as yet. The vines, after being stripped of the nuts, make a forage nearly equal to clover hay, save for the adhering sand and dirt, and stock of all kinds eat it greedily.

After the haulm and nuts are all cleared away, a second crop remains below the surface. This is harvested by swine, which are turned in for the purpose. They turn the soil upside down in search of the toothsome nuts, and however lean the pig may be when it goes in, it soon becomes very fat. The pork of these hogs, though it has a sweet, nutty flavor, is rather soft unless they are finished off with corn before slaughter.

The market for peanuts was formerly controlled wholly by the middlemen, who generally held liens on the crop before it was harvested, for advances made to the farmer. They were never slow to enforce their liens; but came early and took them, so that any future enhancement in price accrued to their benefit, and not the farmer's. But the Farmers' Alliance has changed all that. It stands ready to take the product of the farmer's toil, store it for him, and advance money for immediate necessities. By the aid of the Alliance the producers can fix a price which will at least prove fairly remunerative. The nuts are kept out of the hands of speculative middlemen, and sold directly to dealers at the principal distributing points. They were formerly reluctant to deal directly with producers: but last year they sent their agents into the producing territory to buy freely of the Alliance, whose managers fixed the price.

A bushel of peanuts in the shells weighs twenty-two pounds, and they are put up in bags holding one hundred pounds each. At six cents per pound, the price at which the bulk of last year's crop was sold, a load represents quite a nice sum of money. On a farm adjoining that of the writer, a crop of one hundred and fifteen bushels per acre was harvested last year. But this is very far above the average, which may be placed at twenty-five bushels per acre. A larger acreage has been planted this year than ever before, some growers having one hundred and fifty acres each. If the crop is a good one it will tax the resources of the "Union" to the uttermost.

A BLOOMING GARDEN FENCE.

W. E. PARTRIDGE.

One of the "sweetest" fences that can be found in any part of the country is used in one of the northern wards of New York city, and is becoming a great favorite wherever it is introduced. For a garden and door-yard fence it has good points which make it desirable when no other form of fence would be even tolerable. The foundation consists of light posts spaced about eight feet apart. On these ordinary wire netting thirty inches wide is tacked, this being the full height of the fence. This is of course ample for all garden purposes in the city. The bottom of the wire net is put close to the ground. Six inches up a strand of barbed wire is put, and another on the tops of the posts and along the upper edge of the netting. Where the posts are far apart the netting is fastened to the wire at intervals.

So much for the foundation. The next step is to set out honeysuckle along the fence. One plant to each panel of fence answers very well when one is not in a great hurry. Usually the plants are put in closer, not more than two or three feet apart. The plant finds its conditions exactly suited to its habit and laughs all over. It grows in and out of every mesh. It covers every square inch of the wire, and when the time comes it blossoms as if it had a contract to fill. One of these fences just above Spuyten Duyvil during the past season made the air fragrant for two hundred feet along both sides. It was a sweet fence in fact as well as in name. The appearance of a fence thus formed is very much like that of a hedge, in the color, but the habit of the growth is very different. There is a striking difference in the amount of labor required by the hedge and the fence. The latter if neglected does not run up into a row of tall trees shading the ground for a long distance on both sides. At its worst it may become a somewhat heavy bank, but it will not invade to any great extent either garden or greensward, even after some years of freedom from the knife. The netting insures tightness against anything larger than a sparrow or a chicken. For a division between two lawns or for any purpose where a light ornamental line is needed the vine supported upon netting offers many advantages.

A modification of this fence is made by using the Virginia creeper instead of the honeysuckle. This vine covers the wire even more completely than the other and forms a thick, heavy net of branches that is practically impenetrable even when the netting has been destroyed by rust. It has the same advantages of never getting beyond control in a skyward direction, and of keeping fairly close to its support, while its beauty in the fall of the year can be better imagined than described. This style of vine-hedge has been applied to many of the forms of light ornamental iron and wire fences, and forms a pleasing combination with all of them. Even where there are only three or four strands of crimped wire the effect is beautiful. The fence is of course not proof against the smaller animals unless the wire netting is of very fine mesh, but for ornamental purposes it answers every requirement.

In the northern part of New York city there are still many stone walls remaining around old mansions. These have been frequently planted with honeysuckle, and are now the most beautiful of ornamental fences. The leaves falling very late in the season is another point in their favor, as it gives them, to no small degree, the advantages of an evergreen.

THE ORIGINAL HOME OF ROSA RUGOSA.

PROF. J. L. BUDD, IOWA.

I wish to indorse every word written by Mr. H. W. Hales in a recent number of the AMERICAN AGRICULTURIST in regard to the beauty of foliage, flower, and fruit of *Rosa rugosa alba*, but wish to correct the common belief that it is indigenous to China or Japan. The first thing attracting the attention of the lamented Charles Gibb and the writer in Eastern Europe was the general distribution of varied forms of *Rosa rugosa*. Later we found it apparently wild on the bluffs of the Volga, Don, and other streams of Central and Eastern Russia in Europe, and were told that it was common over Central Asia.

While it is true that our varieties first introduced were from Japan, the fact that they have proven hardy over the whole Northwest, where no Japanese plant will live through the mildest winter, favors the belief that it was an introduced plant in Japan. Again, from China and Japan we have only received the common pink and white varieties, while in Eastern Europe are found many variations in size of bush and flower, color and size, and even tendency to convert stamens into petals. We have one dark pink variety from Central Russia, known as *Rosa rugosa rubra fl. pl.*, which is very dark pink in color, fragrant, and has an average of forty perfect petals. The tendency to variation, and the extreme hardiness of the whole group, point to East Europe and Central Asia as its original home, and Dr. Maximowich and Dr. Regel confirm this view.

THE IRIS.

C. L. ALLEN, NEW YORK.

The general impression seems to be that the many forms of Iris now grown in the garden or greenhouse are, in a great measure, novelties, new discoveries, or hybrids of recent introduction, or that we are indebted to the florist's skill for the many rare forms now in cultivation. The idea is also prevalent that many of the more beautiful forms are difficult to manage. All this is a mistake, as all the species under cultivation, excepting the Japanese forms, were illustrated nearly three hundred years ago, and as highly appreciated then as now. Again, we are in no sense indebted to the hybridist for the rare forms and beautiful colors that this genus of plants affords, for all these are found in the species. The Iris is one of the easiest plants to cultivate. While most of the species have a preference for certain conditions of soil and locality for their perfect developmont, yet they will thrive even under adverse circumstances.

The genus is composed of a large number of species, many of which with a vast number of varieties. All are arranged in three distinct classes, viz., the fibrous-rooted kinds, which grow best in a fine sandy loam, and which increase rapidly every year by suckers from the roots; the tuberous-rooted kinds, which are apt to be destroyed by snails, or to rot from too much wet; and the bulbous kinds, which should be taken up and replanted every second or third year, as the new bulbs, which are formed every season, are always directly under the old bulb. Therefore in the course of a few years the bulbs descend so deep as to be out of the reach of the air, and consequently, become incapable of vigorous vegetation. The bulbous Irises are all remarkably beautiful; they include what are commonly known as the English, the Spanish, and the Persian Irises. All of these are classed hardy, and under some circumstances they are. But they will not endure severe freezing, or a wet situation, and it is by far better to plant in a soil with good drainage and then to protect them with a mulch of coarse litter or leaves. The German Iris is perfectly hardy, and will grow any-

where. The species are tuberous-rooted, and are rapidly increased by division, which should be made in the autumn. A beautiful ribbon border can be formed of these by arranging the colors, which contrast finely, in rows to suit the taste.

The grandest of the species, the subject of our illustration, is *Iris Kæmpferi* popularly known as the Japan Iris. The plants are perfectly hardy, and are very free flowering. The flowers are both double and single, from six to ten inches in diameter; the colors, pure white, purple, maroon, and blue, in all the shades these colors are capable of producing, and many with the colors marbled and penciled in the most strange and beautiful manner. They grow readily in any soil or situation, but succeed best where there is plenty of moisture, and in a situation where they are protected from the midday sun; as they flower in July, succeeding all the other Irises, the full sunshine will prematurely dry up the flowers. This has been a remarkable season for this Iris. The past mild winter dealt kindly with them, as with most other herbaceous flowering plants, and all show by their profusion of blossoms their appreciation of kind treatment. The plants which have produced the flowers shown in the engraving were all grown from seed sown two years ago. A few bloomed last year, which was the second from the sowing of the seed; the best flowers, however, do not appear first. As in the production of other plants from seed, there will be a proportion of flowers much better than the average, and the best only should be saved for propagation either by seed or division. The *Iris Kæmpferi* to succeed well must not remain where planted more than two or three years without division, and it is better to divide a portion of the plants annually, in October. By leaving them undivided a long time they do not get sufficient nourishment from the soil to perfect their flowers.

SEEDLING JAPAN IRIS.

Fragrant Flowers at Christmas.—Hyacinths planted this month, and properly cared for, will bloom about Christmas. After the bulbs have been potted in rich soil, the pots should be covered with six inches of sand, and kept dry. When well rooted, remove them to a warm, light place, and give plenty of water.

HOUSEHOLD

It All Depended.

DORA HARVEY VROOMAN.

"Are you going to the Fair, Mr. Jones?" said Mr. Hall, as he met the old farmer one evening coming from the store.

"Wal, I reckon not; I don't take no stock in county Fairs. There's allus a big splurge; prizes is give out, but not to the one thet's most disarvin', but to the feller that can sling the most cash; at least thet has been my experience," said Farmer Jones as he took out his red bandana and wiped the dust from his hat.

"I didn't have a very good opinion of county Fairs myself at one time," said Mr. Hall, "but then, you see, it's like everything else, it all depends—'circumstances alter cases,' as the old saying goes."

"Wal, thet's true enough," replied Mr. Jones, "but I guess I won't send nuthin' to the Fair, even if I *do* go and see it. There's old Brown, now, he'll cart his petaties, squashes, and some of them big punkins what he dotes on, over to the hall. They ain't none of them wuth nuthin,' but he'll fix 'em all up, fancy like, and set all his flowers round, and everybody what comes along will say, 'Oh! How lovely!'—and so it will look nice, 'cause his flowers will be mighty fine. Along comes the chaps what give the prizes out. Brown, smilin' like, will stand out front, rubbin' his hands—so—. Then he'll say (you know he's got so much brass), 'Good evenin', sirs. Come inside, I'll let you taste some of my rare old cider. My Bet's got the name of makin' the best cider all round the country.' Then they goes inside his railin' and he gets out his jimmyjohn, or whatever you calls it, and gives them somethin' what *he* calls cider; but *they* knows better. Wal, when the prizes is gin out, Farmer Brown gits one."

"Well, then, Mr. Jones, why don't you do that? It is a cheap trick," said Mr. Hall with a smile.

"I s'pose I could," said Jones, "if I'd been born with what I calls cheek. Now, Brown, he's got a lot o' it and uses it every time he gits a chance. But what do you know about county Fairs; you ain't no farmer, be you?"

"No, I'm not a farmer, nor never was one either, but I know something about county Fairs for all that," said Mr. Hall. "I used to be in the piano business, you know, and one time conceived the brilliant idea of introducing my pianos as a feature at a Fair up in Orange county. I hauled two or three of the finest I had in my place out to the Fair grounds. I had a platform made, decorated the whole thing up with flags, flowers, plants, greens, and the like. I tell you what, we fixed it up fine! We then hung up great signs, painted in showy, fancy letters, bearing the name of HALL & CO., PIANO WAREROOMS, NEW YORK CITY. I engaged a fine pianist to play during the whole Fair. Either my wife or I was on hand all the time to take orders, or to see that anything was played that the farmers wanted, from 'Yankee Doodle' to the 'Doxology.'

"When we went to the inn that night, I said to my wife, 'Our scheme is going to pay after all; our corner attracted more attention than the whole show put together; didn't it, now?' 'Yes,' said she, in her quiet way, 'but you musn't whistle till you're out of the woods, you know.'

"'That's just like you women' said I. 'I wish I hadn't brought you up here at all; I believe you'll be a regular Jonah?'

"You see I was provoked, because I had my own doubts, and I was anxious that she should be hopeful and so encourage me. She didn't say anything but I saw that she was hurt, and immediately felt sorry for my hasty words, but man-like, I wouldn't say so.

"Well, time flew on; our corner was still the attraction to the end. Sometimes when the pianist struck a popular air, the whole crowd, both young and old, would join in and sing with all the strength of their lusty voices. The closing time came at last. How many had I sold? *Not one!* Disgusted? Well, I guess so. I felt as the boys say, 'as if I had been drawn through a knot-hole.'

"I expected my wife to say 'I told you so,' but she didn't; she was as cheerful as a cricket and as merry as a lark; she laughed at the fun we'd had, and said as we hadn't been able to have a trip when we got married, that she'd always call this her 'tower.' I tell you what, when your wife pulls at the same end of the rope that you do, things run along ever so smooth; but just let her pull the other way and everything goes to smash quicker than you can say, 'Jack Robinson.' But, to come back to my story. We carted all the pianos back to the city; counted up how much we were out, and made a vow never to go to a county Fair again.

"The Fair was held in the early fall. One afternoon, near Christmas time, as I was gloomily going over my books, in walked a number of ladies. They were the wives and daughters of some of the Orange county farmers who had been to the county Fair. They wanted to buy pianos, or at least, to examine and price them, and see what terms could be made. They said they had been to the Fair in the fall, and as they had seen and heard my pianos, they thought they'd come to me before going anywhere else.

"Well, to make a long story short, they were very hard to satisfy, and at last I became desperate. I was, however, determined to sell if it were a possible thing. Finally, I offered to do as they usually do with sewing machines. I'd send them each a piano and let them have it on trial for a month; if, at the end of that time if they were not satisfied I'd take them back. This idea seemed to please them. During the following week I sent pianos to seven different persons. When the month was up I called on each. Six of the seven bought.

"The seventh was a bluff, ignorant old fellow; had, or seemed to have, more money than he knew what to do with. Always fond of making a big show. He said, when I asked how he liked the instrument, 'Oh, it's all well enough but is that the best you got? If Jack Jones and Pete Smith can git one like thet, I'll be blowed if I don't want one better!'

"I told him I could get one better, so I promised to bring one out. We carted back the one we had left, and brought out a Chickering—a beauty!—a twelve-hundred-dollar one. When we got there with it, it was evening. They were holding a Dorcas Society, or Sewing School, or something of the sort, there, and all the old ladies of the neighborhood were on hand. I had brought with me a pianist, one of those fellows who could play by ear, and one who could play anything he ever heard too. We set the instrument up in the parlor. Then the music began. Everybody's wish was granted. He played everything he could think of. The old ladies and the young girls were all delighted. After having a merry time for an hour or so, the old fellow beckoned to me and I followed him into the hall.

"'Thet's better then the others bought, isn't it?' said he.

"'O, of course,' said I, 'they were six-hundred-dollar pianos, and this costs twice as much.'

"'Has it got all the chunes in it the others had, and more too?' he asked.

"I was rather surprised at this, but answered promptly, 'Yes, it has as many tunes in it as was ever played.'

"'Wal, tain't the money,' said he, 'but I wan[illegible] my gel to git the very best. Do you think she can

"HE JUMPED UP AND DANCED TO THE MUSIC."

turn all them chunes out of the machine as well as you ken?'

"I hastened to assure him that, with a little practice she certainly could.

"'There's only one thing more I wants to say. When I was a lad we used to sing a chune called 'Adam was the first man; Eve was the second.' It was my favorite. Now, if the chune's in thet box I'll take her, and if it isn't, I won't. There's my hand on't.'

"I was staggered. I had pretty good faith in my pianist—but suppose he didn't know just that one tune! He noticed my hesitation, and said, with a grin, 'Yew can't cheat me—thet chune ain't in her.'

"'Yes, it is,' said I, 'I'll take your offer.' It was a big risk, but I made it. We went back to the parlor, and the old fellow asked to have his 'chune' played. The pianist didn't seem to know the air, and I felt the chills, first hot and then cold, chasing each other up and down my back.

"'Whistle a little of the tune,' said my young friend, pluckily. 'Maybe it's got two names.'

"The old farmer started off. I saw in an instant that it was all right. One of the most popular songs of that day had been adapted to that very air. 'That will do,' said the young fellow, and swinging himself round on the piano-stool, began to play with a hearty good will. The old fellow was so pleased that he jumped up and danced to the music.

"That settled it. He bought the piano, and paid cash down too. You may be sure I gave my young friend a handsome present then, and, later on, a far more valuable one, for he now is teaching the baby to say 'Grandpa.'"

"Wal, I've been dreadful interested," said Mr. Jones; "thet Fair certainly did do some good."

"And, now," said Mr. Hall, "you see why I have a good word to say for county Fairs, don't you?"

"Yes, but I agree with what ye said fust, when ye said, 'It all depends,'" said Farmer Jones as they shook hands and said good night at the corner of his lane.

What Mr. Jones had heard set him to thinking, and he will probably be represented at the next Fair.

Favorite Lace.

FRANCES H. PERRY.

Chain forty-one stitches.

First row: One treble in sixth stitch,* chain one, pass one, one treble in next, repeat from star five times; *chain three, one treble in next stitch, pass three, one treble in next stitch, repeat from star three times, chain three, one treble in next, two trebles in next, chain three, turn.

Second row: one double crochet over third treble,

CROCHET LACE.

three trebles over next treble, *chain three, one double crochet in middle stitch of three chain, three trebles over next treble, repeat from star twice, chain three, one double crochet over next treble (the first treble in heading), chain two, *one treble under next space, chain one, repeat from star six times, one treble in third stitch of top loop, chain four, turn.

Third row: One treble under first space, *chain one, one treble under next space, repeat from star five times; chain three, one treble over next treble, *one treble over the first one of the next three trebles, chain three, one treble over next treble, repeat from star three times, two trebles over next treble, chain three, turn.

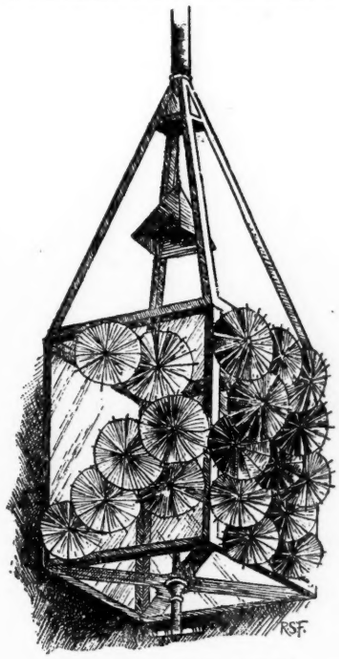
Fourth row: Same as second.

This lace, like many other patterns, will be found much prettier than any representation of it can be. It is very easily made, for, as will be seen by the directions, the entire pattern is comprised in two rows, and there are no difficult stitches; it is, therefore, recommended for those who like rapid work, or for "pick-up work" for those who wish to improve odd moments fashioning pretty trimming. To change the width, increase or decrease the number of stitches in the heading by twos, or in the other portion by fives.

Home Hints and Suggestions.

KATHERINE B. FOOT.

A woman of keen artistic perception was obliged to put in a very large hall a lantern of clear plate glass, as the light was needed on the stairway, and



SHADE FOR A HALL LIGHT.

stained glass would have obscured it too much. The light from it was glaring and most annoying as it shone into the open doors on either side of the hall. After a little thought this ingenious woman bought several dozen of the tiny Japanese parasols to be found at Japanese stores, and first fastened a small piece of tape to the top of the sides of the lantern. After that she pinned on a few parasols—first breaking off the handles—and upon each of these three others, and so on until the sides were covered; through which the light had been annoying. The effect was unexpectedly exquisite. The light was softened and not obscured, and the lantern became at once a pretty thing instead of an ugly one. The cost was trifling as the little parasols can be bought by the dozen for a small sum. The engraving shows exactly how it looked. The idea was not to cover the entire sides, but to shade the light where it was disagreeable.

This same ingenious woman found out two new uses for a common lapboard such as every mother of a family preserves and uses,—the kind with a hollowed-out place in front that will fit firmly on the lap. One child in the family would fall out of bed every night. He was too big for a crib, he wouldn't stay penned in, he fell against an array of chairs and pushed them off, and pushed them over—making a nightly clatter and riot, and there seemed to be no remedy. One day his mother had an idea and tried it practically that very night, and like all great inventions it worked instantly and to such purpose and so simply that she has wondered ever since why she never thought of it before. She pushed the lapboard down between the side of the bedstead and the spring bed. It stood up a perfect barrier to falling out of bed. It was absolutely firm and no kicks could move it. Since then no child has ever fallen out of bed in that family.

The other use was to make a bed of it when a feeble old woman was taken to drive in a carriage. Lift up the cushions on each seat; lay the lapboard across with hollowed-out side toward the inside of the carriage. Put back the cushions—lay a pillow on the board—and you have a perfect and a very comfortable bed. The hollowed-out side gives room for another person to sit comfortably beside the invalid.

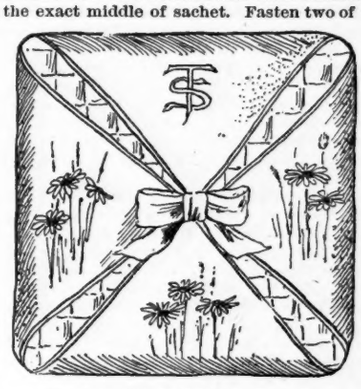
Now when September has come the children who have been free all summer will have to go to school again. It will make them cross and fretful for awhile; so do be patient with them. It is hard to be shut up in the often stifling September days, and indeed, the truly wise mother will say, "no school until October." The children will learn more by beginning later in the fall than by going through a cramming process at a season of the year when no young child should be permitted to study, or to be shut up in a school-room.

In these days of brilliant fall flowers, remember the sick people and the poor ones. The fall flowers last better than those of midsummer. It almost seems as if they bravely determined within themselves to last as long as possible, and a handful given here and there will give so much pleasure. Just try being an individual flower mission these bright fall days,—especially you who live in the suburbs of large cities. Pick a good bunch every morning before going to town, and give it to the first street gamin you see. You will be amazed to see how quickly they will be taken, how eagerly and gratefully you will be thanked, and how the gray, dirty, little face will light up. Try it once and see. "Try it and you'll buy it" we have all heard, but try this, and no money will buy from you the glow that you will take to your office or about your shopping. The knowledge of having helped along does help oneself as none of us know until we try it.

Handkerchief Sachet.

EDITH HOLME, NATAL, SOUTH AFRICA.

A foot square of pearl-gray plush and shell-pink silk will be needed for the sachet. Have both the materials quite square. Work any kind of flowers in three of the corners of the plush, and in the fourth corner the initials or name of the person who is to be presented with the sachet. The flowers and name should be worked with shell-pink silk. The square of pink silk should now be laid upon cotton wool and then quilted; of course the wool must be freely scented with sachet powder. Tack the plush and quilted silk together now and bind them with very narrow ribbon to match the silk. Take the four corners and make them meet in the exact middle of sachet. Fasten two of the



PLUSH SACHET-BAG.

corners by means of a small button-hole and pearl button; the other two corners must tie with a large bow of wide pink ribbon. The sachet is now complete.

Aunt Cora's Lace.

M. B. H.

Cast on twenty-six stitches, and knit across plain.

First row: Knit twelve, over, narrow, over, narrow, knit two, over twice, narrow, knit four, over, narrow.

Second row: Over, narrow, knit six, purl one, knit two, over, narrow, over, narrow, knit twelve.

Third row: Knit four, narrow, over twice, nar-

row, knit four, over, narrow, over, narrow, knit nine, over, narrow.

Fourth row: Over, narrow, knit nine, over, narrow, over, narrow, knit six, purl one, knit five.

Fifth row: Knit two, narrow, over twice, narrow, narrow, over twice, narrow, knit two, over, narrow, over, narrow, knit two, over twice, narrow, over twice, narrow, knit three, over, narrow.

Sixth row: Over, narrow, knit five, purl one, knit two, purl one, knit two, over, narrow, over, narrow, knit four, purl one, knit three, purl one, knit three.

Seventh row: Knit four, narrow, over twice, narrow, knit four, over, narrow, over, narrow, knit eleven, over, narrow.

Eighth row: Over, narrow, knit eleven, over, narrow, over, narrow, knit six, purl one, knit five.

Ninth row: Knit two, narrow, over twice, narrow, narrow, over twice, narrow, knit two, over, narrow, over, narrow, knit two, over twice, narrow, over twice, narrow, over twice, narrow, knit three, over, narrow.

Tenth row: Over, narrow, knit five, purl one, knit two, purl one, knit two, purl one, knit two, over, narrow, over, narrow, knit four, purl one, knit three, purl one, knit three.

Eleventh row: Knit four, narrow, over twice, narrow, knit four, over, narrow, over, narrow, knit fourteen, over, narrow.

Twelfth row: Over, narrow, knit fourteen, over, narrow, over, narrow, knit six, purl one, knit five.

Thirteenth row: Knit twelve, over, narrow, over, narrow, knit fourteen, over, narrow.

Fourteenth row: Bind off six, knit nine, over, narrow, over, narrow, knit twelve.

Begin at the first row.

Pickles Sweet and Pickles Sour.

In pickling, it is always safer to use a porcelain or agate iron-ware kettle; but if a brass utensil is the only one available it should first be well scoured with salt and water, and the pickles never be allowed to remain in it very long. A good cider vinegar is a necessity and it should be both clear and strong. The fruit or vegetables too must be fresh and firm, for if at all withered the pickles are sure to be flabby. Take plenty of time to the work, and when completed either keep the jars in a dark place, or else wrap them in blue or brown paper. If it is desired to have the pickles very green, line the kettle with grape leaves, or sprinkle with powdered alum—the proportion being a teaspoonful to a gallon of water—but many good housewives do not consider it necessary to "green" even their cucumbers, as it adds nothing to the flavor and gives them a "shoppy" look not always desirable.

For those vegetables that are to be laid in salt and water before pickling the old direction "brine strong enough to bear up an egg" is as good as any, and this calls for about one quart of salt to three gallons of water. Lay a plate on pickles to keep them well under the vinegar. If scum ever appears on top, turn off the vinegar and wash the pickles thoroughly. Then boil the vinegar and skim off all froth, continuing the boiling as long as the scum rises. Throw back over the pickles while still hot.

An easy method of putting up the tiny cucumbers known as gherkins is recommended as follows: Soak them in brine for forty-eight hours, then to each one hundred gherkins allow an ounce of mustard-seed, an ounce of cloves, a tablespoonful of salt, a cupful of sugar, and two small red peppers. Do the spices up in thin muslin bags using two bags to each hundred pickles. Place the cucumbers in a kettle on the stove and cover them with vinegar. Drop in the bags of spice, slice the peppers and heat all together slowly. When scalding hot, they are ready to pack away in a stone jar, but should be examined a week or ten days later and any soft ones extracted.

Chow-chow is always a favorite pickle, and a nice recipe is, one head of cauliflower separated into tiny sprays; one quart of sliced cucumbers; one pint of small onions, cut in half; one quart of green tomatoes sliced; four green peppers sliced; five pints of vinegar, two cups of granulated sugar, one teaspoonful each of ground cinnamon, cloves, mace and celery seeds, and four tablespoonfuls of ground mustard. Mix all the condiments together except the mustard, and tie them in two small muslin bags. Place these and the vegetables in a preserving kettle and pour over them the cold vinegar, into which has been stirred the sugar and mustard. Bring to the scalding point, boil for half an hour, and then set away in glass jars or bottles.

One of the most delicious pickles, and one that seems comparatively little known, is made of green tomatoes. To one gallon of green tomatoes, take six onions, one quart of cider vinegar, two cups of sugar, one tablespoonful each of mustard, black pepper and salt; two teapoonfuls each of allspice and ground cloves. Slice, but do not peel the tomatoes. Peel and chop the onions very fine. Put a layer of tomatoes in the kettle and sprinkle with onion, sugar, and spice. Then more tomatoes, and more sugar, spice, etc., alternating, until all are in. Heat slowly and stew gently for three-quarters of an hour after they begin to boil. This pickle should be put up in small jars as it does not keep long after being opened. It is a most appetizing accompaniment for cold meat.

A sweet pickle equal to that made of citrons, can be concocted from the rinds of watermelons, the portion of that fruit which is often thrown away. Boil two pounds of rinds in clear water until quite tender. Drain them well. Make a sirup of two pounds of sugar, one quart of vinegar, half an ounce of mace, an ounce of cinnamon, and some roots of ginger boiled until thick. Pour over the melon-rinds while very hot. Drain off the sirup the next day, heat it again, and again pour it over boiling hot. Repeat this for three days in succession, after which it may be left on and the pickles set away. They will keep for two years.

Odds and Ends.

D. OSBORN.

If you have brick paths about the yard or garden you are no doubt troubled by their becoming green and slimy during the rainy weather. Hard scrubbing often fails to remove such stains. Go to the druggist's and get some "Venetian Red." (It costs but five or six cents a pound, and two pounds will go a long way.) First, wash the dirt from the bricks with clean water; then sprinkle the powder lightly over the bricks and distribute it evenly with a wet broom. This makes the bricks a bright red. It also fills up the crevices between the bricks and prevents weeds and moss from growing there. By doing this twice a month you can keep your paths in good condition.

Smoke-stained lamp chimneys can be cleaned with salt. Wash them clean first with warm water and soap, and while wet rub them well with dry salt. This will remove the most obstinate stains. Vinegar is a good thing for the same purpose.

Shoes lying about make an otherwise neat room look very untidy. If you have not much closet room it is a good plan to make a shoe box for each room. A soap box covered with cretonne or chintz is just the thing for this purpose. Put a box-plaited flounce around the sides of the box. Make a cushion for the top of cotton batting, hair or excelsior, and cover with cretonne or chintz to match the flounce. Line the inside of the box with either muslin, silesia or paper. This makes a nice seat to use while putting on one's shoes and stockings, as it is so much lower than a chair.

Very pretty reminders of a summer jaunt may be made as follows: While in the meadows or woods gather any oddly or prettily colored leaves, a few sprays of grasses or ferns, a few clusters of clover and daisies, and lay them smoothly between the leaves of a book to press. After you are home again take them out and fasten with a little mucilage on a square piece of stiff drawing paper. Arrange them as artistically as possible; then mark across one corner the date when and the place where gathered. If you wish they can be framed in neat little oak frames at a trifling cost. They make very dainty little ornaments for a bedroom or library.

Save all your old white muslin. It makes good dusters and will also be useful for cleaning windows, as it is free from lint.

When tablecloths are worn beyond mending cut square pieces from the best parts of them and hem them neatly. They make nice napkins for the little children to use at the table, and also do nicely for them to carry their lunches to school in, for if they are stained or lost it will not matter much, as your sets will not be broken.

Items of Fashion.

Truly, this might be called the "Reign of Jackets," for never have these garments been so much in vogue, or appeared in such a variety of styles, from the gay and giddy blazer which adorns the tennis-fields to the short, dainty little affairs, with half long or no sleeves, known as the "Figaro." These last are made of any and everything, wool, silk, lace, velvet, braids, gimps, embroidery, or whatever any lady pleases, and they add a coquettish attractiveness to most costumes. Usually, however, this little jacket is worn over a blouse waist—preferably white—the full sleeves showing prettily below the loose ones that extend only to the elbow. Regular jacket-wraps, that will be worn far into the autumn, however, are well liked of white, tan, and gray cloth. Some are extremely plain, being merely stitched on the edges or else brightened only by a tiny finish of gold or silver braid around the collar and cuffs. Others, however, have velvet or—strange to say—lace sleeves, while a few are elaborately braided in intricate designs. Another and very useful outside wrapping that is excellent either for warmth, or for protection from dust is the circular cloak made with a yoke and a kilted shoulder cape. Formed of flannel, pongee, or brilliantine, it entirely conceals the dress beneath while a gathering at the waist-line, in the back, holds it in place. Ribbon ties fasten it at the throat and are the only trimming.

Bright red frocks are popular with both blondes and brunettes, especially the scarlet India silks, decorated with black lace and velvet and with a Spanish or Figaro jacket of passementerie worn over a tight-fitting bodice, that has the sides lengthened to form large, square pockets. The skirt is nearly straight, draped over a black foundation, and has lengthwise rows of black velvet ribbon extending down one side, and passementerie ornaments set at equal distances around the bottom.

Rough woolen serge and camel's-hair suits are stylish in blue, green, or the new light tan or mushroom color. They are much worn in the mountains and will be serviceable throughout the early fall. Wide Hercules braid is the approved trimming for these, and it is set on in encircling rows, red being used on blue, brown on tan, and black on green,—while these braid bands are piped on each side with narrow gilt braid. Brilliantine gowns grow more and more in favor and are inexpensive; while the finer qualities far exceed cheap silk in appearance. Elderly ladies welcome these black mohairs as just what they have long desired, and younger women choose the neat striped and bordered ones for street wear or the pure white ones for afternoon gowns, making the latter up with vests and fronts of gaily flowered China silk, remnants of which have been sold very low all summer.

Plaids increase both in size and popularity. Complete, they are only used for morning dresses, but, combined with plain wool, silk, or velvet form a pretty demi-toilette. Plaids, cut on the bias, are also arranged as trimming on a plain costume, being laid on the skirt in graduated bands the widest at the bottom and the narrowest forming the top row; while sleeves and vest of the same are set in the corsage.

The crownless hat has not proved a success and is rarely seen. Not so the perennial sailor hat. That is as *chic* as ever, and is, without question the rage, unbecoming as it is to many. Perhaps its popularity is somewhat due to its according so well with the stiff shirt-fronts, gentlemanly neckties and mannish jackets, adopted by many girls, a fashion which we record but scarcely approve. A little lower of crown and wider of brim, the newest sailors now appear in fancy and mixed braids, one of the prettiest being a combination of old rose and light brown straw. Others are finished around the edge with an open lace pattern; while the tarpaulin, or patent-leather sailor hat, comes only in black and white. These latter are very nice for boating or for rainy weather. Large flats are lovely, with a soft fluffy band of feathers laid along the brim, and a few ribbon loops and short tips trimming the low crown. Other handsome round hats display an English style known as the "Prince of Wales's feathers," and consists of a cluster of very slender ostrich plumes curling over the top. These appear held by a bow of velvet ribbon placed directly in front, the long loops of which trim the sides of the hat.

With low shoes of russet or gray leather, stock-

ings to match are considered smart, but in general, Balbriggan, lisle-thread and silk hosiery in pure onyx black is most worn. For evening-dress, however, the latest caprice is to have the hose and slippers of the same shade as the gloves. The tan shoes which came into vogue about two years ago are still in high favor for warm weather, as they are said to be cooler than black, but they are now darker and of a more reddish hue than in past seasons. Buttoned boots of kid and patent-leather combined are the dressy shoes, but laced boots are coming once more in fashion and are sometimes made gay with bright-hued lacings. White canvas ties, with tips and straps of white kid are worn with light, summer gowns.

Tan and gray gloves are about equally in favor, and may accompany any costume. They are more stylish of undressed kid with a modest stitching of the same color; and may be either in mousquetaire shape or fasten with four buttons. The "sac" glove, minus all opening is easily drawn on and is used for *négligé*, but it is not pretty. Mitts are little seen but silk gloves are very extensively worn.

And now for just a few hints to the home dressmaker and milliner. In stitching waists, always use silk in place of cotton. It pays in the end. Press the seams well, and herring-bone the bone casings in place, with some bright colored silk or cotton.

Skirts are now almost sheath-like in their narrowness, so draw them back by two tapes set twelve and twenty-four inches below the belt and sewed in the side-back seams. Skirt braids are applied flatly against the facing and show only one-half the width below the edge.

In facing the brim of a hat, always cut the shape first in stiff paper and fit it in, as a pattern by which to cut your material. Then slip-stitch the facing smoothly in place. Bows and loops of ribbon should have their ends twisted with wire, instead of sewed, as it gives them a less stiff appearance.

Some Pretty Trifles.

RUTH PERCY.

An Odd and Pretty Hair-Pin Holder is made in the shape of a tiny boat. Cut two pieces of cardboard of the desired shape, and cover both sides with plush or silk; then sew them together at the ends and shorter sides. Fasten tiny silken cords and tassels at the two ends, and upon one side outline a design of two crossed oars. Six inches for the lower line and three inches for the height of the boat make a good proportion.

A Useful Article for the Housewife is a bag for holding keys. The best material for this is chamois leather. Cut the desired size, and line with crimson silk. Make a narrow casing at the top, leaving enough to form a heading, and run in narrow ribbon the color of the lining for drawing up the bag. On the leather embroider the word "keys," using wash silks to match the lining and ribbon.

A Handsome Photograph Case is also made of chamois leather lined with yellow satin. It is folded over about two inches at each end, thus forming two shallow pockets. On one is written in gilt letters the word "Photos"; on the other is painted a cluster of wistaria leaves and flowers. Ties of yellow moiré ribbon are fastened at the ends for closing the case.

An Inexpensive and Pretty Stocking-Basket may be made by taking two peach baskets and fastening them firmly together in the form of an hour glass. Cover with fine sateen in some pretty pattern, leaving it quite full at the top and bottom. Line with any material wished. About an inch from each end tie a band of wide ribbon around the basket, finishing with a bow. Around the center tie another band of ribbon the same as at the ends. Make pockets for the yarn and leaves for the needles and fasten them to the inside.

A Pretty Parlor Dust-Bag is made thus: Take a piece of china or pongee silk ten inches wide and thirty long, double the ends together, turning one to a point. Leave an opening in the seam, which should be at the back, large enough to admit the hand to slip in the duster. Ornament the ends with small silk tassels, and suspend by a ring through which the bag is drawn.

A Handsome Sofa Cushion is made of peacock-blue plush, embroidered with wild roses. The edge is finished with heavy silk cord, with loops of the cord at the four corners.

An Ornamental Newspaper Holder is made of a square rush mat. A heavy rope cord is sewed around it, leaving a loop at one corner by which to hang it up. It is then given a coat of bronze lustra paint. When perfectly dry, draw the corner opposite the one with a loop and the two side corners together and fasten firmly, placing a large bow of ribbon where they meet.

A Handsome Ornament for a Hanging Lamp is made from a tiny glass tumbler two and a half or three inches across the top, half a spool of knitting silk and four yards of ribbon half an inch wide. Crochet a chain that will fit around the top of the tumbler and fasten with slip-stitch. Crochet a shell, fasten and chain four, make a shell in the sixth stitch from the last shell, chain four, shell in the sixth stitch and so on until the chain is full. Then fasten the last four chains in the side of the first shell. Repeat until the case is long enough; then run the ribbon through each row of open-work, leaving a small piece at the top to turn under. Finish with long loops and ends at the bottom and ties at the top to hang by. Fasten under the hanging lamp for holding matches.

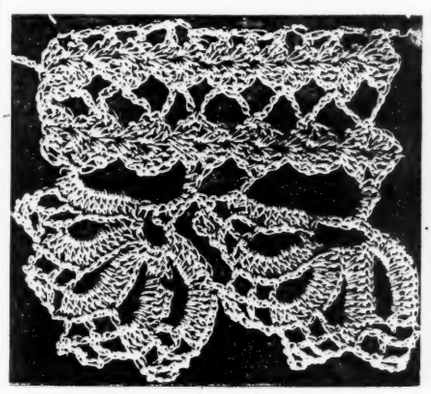
Crochet Point Lace.

M. B. H.

Crochet a chain of fifteen stitches.

First row: Make a shell of three double, one chain, three double in the fifth stitch from the needle, and then catch with single crochet into the next stitch in the chain, three chain, shell in the third stitch from the first shell, chain three and turn.

Second row: *Shell in shell, catch with single crochet in the last stitch of the under shell, chain



POINT LACE CROCHET.

three, shell in shell, one double in three chain at the top and turn*. (The stars mean to repeat.)

Third row: Shell in shell, repeat from stars till you have a double row of six shells connected by the little chains.

Fourth row: Chain fifteen and catch back into the fifth stitch from the shell making a loop of the last ten stitches in the chain, chain seven, count back four shells and catch with single crochet in the point of fourth shell; turn.

Fifth row: *Twelve double over the chain of seven, catch into the loop with single crochet, chain seven, one double in the eighth double, chain two, one double in the tenth double, chain two, one double in the twelfth double, chain four and turn.*

Sixth row: Double in double, chain two, double in double, chain two, double in double; repeat from * to * till you have eight rows of doubles.

Seventh row: Single crochet in each of the five chain; this brings you back to * shell in shell. Catch with single crochet in the last stitch of the under shell, chain three, shell in shell, one double in the three chain at the top, chain three and turn.*

Eighth row: Repeat from * to * till you have a double row of four shells, one double in the three chain, and catch with single crochet into the last double in the last row of doubles. This makes one figure.

Ninth row: Shell in shell, catch with single crochet in the last double of the under shell, chain three, shell in shell, one double in the three chain, and turn; repeat till you have a double row of six shells connected by the little chains, and then begin with the fourth row again. Connect the first and second points of the figure each time.

Seasonable Recipes.

Peach Shortcake.—Sift a quart of flour with one teaspoonful of salt; wet with buttermilk into which a level teaspoonful of soda has been dissolved until a soft dough has been formed. Work as lightly as possible with the tips of the fingers and pat into a cake about ten inches in diameter. Bake on a griddle; split open while warm, butter both halves liberally and on the lower put a thick layer of peaches sliced and sugar; lay on the upper half, and eat with sweetened cream. Do not use a knife in splitting the shortcake, but pull it apart with the fingers and drop the butter on in bits rather than to spread it with a knife.

Fruit Sirup for Ice Creams.—The following recipe for fruit sirups is from a Southern lady and may be relied upon. Put into a porcelain-lined kettle one gallon of any of the small fruits and add enough water to keep them from burning. Generally a cupful will suffice. Cook until tender, heating very slowly. Strain through a cloth, and to every quart of juice add a pint of sugar. Boil fifteen minutes, pour in glass jars and seal up. In making ice creams the addition of this sirup will give as delightful a result as if fresh fruit were used.

Raspberry Pie.—This odd recipe is as excellent as it is unusual. Put into a granite saucepan a pint of fine ripe raspberries; add three tablespoonfuls of sugar and two of water. Set the pan over the fire and shake constantly until the juice flows freely, but do not allow the raspberries to lose their shape. Lift out with a skimmer and boil the sirup until clear. Turn out into a mixing bowl while you beat a piece of butter the size of an egg to a cream with two tablespoonfuls of fine sugar, one of bread crumbs and the yelks of two eggs well beaten; add the whites of two eggs whipped to a froth; line deep pie plates with a rich paste, lay in the fruit, pour over them the sirup, put this mixture on top and bake in a quick oven.

Huckleberry Pudding.—The very best batter for berry puddings is made by beating two eggs, to which add a little salt, a pint of milk and flour enough to make a thick batter. Sift two level teaspoonfuls of baking powder through one cup of the flour, stir this in and add enough to make the batter of the right consistency; dredge a pint of huckleberries or any small fruit with flour, stir in at the last and boil in a buttered mold or floured cloth for one hour. A raised batter for huckleberry pudding is preferred by some and is made like the above, omitting the baking powder and adding one gill of baker's yeast and a half teaspoonful of soda dissolved in boiling water. Set to rise in a warm place for four or five hours, stir in the dredged fruit and boil for two hours.

Cheesecakes.—The real old-fashioned cheesecakes require the curd of milk for a basis. They are great favorites with the Jewish people and are liked by many Americans as well. The recipe given here is from a Jewish lady famous for her cookery of many national dishes. Rub the curd from one gallon of milk in a coarse cloth until free from whey; work into it six ounces of butter, one and a half soda crackers rolled fine and an equal quantity of bread crumbs; add half a teaspoonful of cinnamon and a little salt, the yelks of five eggs and the whites of three; six ounces of fine sugar, a tablespoonful of brandy and half a pint of cream. Mix these ingredients thoroughly and rub through a coarse sieve before adding half a pound of washed and dried currants and half an ounce of citron minced very fine. Line pie dishes or patty pans with rich paste, fill with the mixture and bake in a rather brisk oven. Twenty minutes should suffice.

Potted Liver—Farmers who live at a distance from a market will find this a delicious use for the liver of the veal which they may kill, as country butchers often do not appreciate the value of a veal's liver and will give as much for an animal without either that delicacy or the sweetbreads. Boil the liver until tender, turn out in a wooden chopping bowl and beat with a wooden potato masher while hot. Remove all skin and gristle and pound to a paste, seasoning with salt, cayenne, cloves and mace; add enough of the gravy to make a smooth and creamy paste and pack in small cups or jars. Pour melted butter over the top of each until well covered and keep in a cool place. It is very nice for luncheons or supper in hot weather. Turn into a platter, slice thinly and serve with thin strips of buttered bread, white or brown or spread over hot buttered toast.

A Rag of Linen.

FANNY M. JOHNSON.

"Olive! Olive Maclean!" called Mistress Dawson up the stairway which led from the farmhouse kitchen.

There was a quick step across the room overhead and then appeared at the top of the stairs a bright-looking, rosy-cheeked Scotch girl of nineteen or twenty.

Olive Maclean had come from Scotland to the Massachusetts colony about a year before, and already her old-country skill at weaving fine and beautiful patterns of table-linen had given her a wide reputation among the housewives of the country. None of them could pretend to equal it, and her services were much in demand from the wives of the farmers who were sufficiently well-to-do to afford them.

"It's the Jacksons' hired boy," said Mistress Dawson, lowering her voice as Olive reached the foot of the stairs. "Mrs. Jackson wants you to come and weave up a fine piece of linen she's had spun. You're to ride back with the boy on the pillion."

"The Jacksons? Where do they live? I do not know them," said Olive, speaking her words in the broad, quaint Scotch fashion, which will be rendered here in plain English.

"They live about three miles away on the Beech meadow highway," replied Mistress Dawson. "They're odd, unsociable sort of folk and don't neighbor much, but they're well-to-do and you'll get your pay."

"I might go for a week or ten days," considered Olive. "I'm not due at the Trumbulls till the week after next. Tell the lad I'll be ready in a few minutes."

It was but a very few minutes before Olive appeared at the gate where the Jacksons' hired boy was waiting on horseback. She wore a neat gray cloak, and a simple hood framed her rosy face. A little bundle held the few belongings which she would need for the week. Putting one foot on the mounting block and one hand on the horse's back she sprang lightly to the pillion, and holding the bundle before her sat straight and easy behind the boy in the saddle as they cantered along the lane in the common fashion of riding in the year 1767.

It was autumn, and the frost had already touched

"THAT'S MARGIE."

the trees and the foliage along the way was turning all the shades of red, gold and gray. There were only two farm-houses to pass in the three miles' ride from Farmer Dawson's house to the farm of the Jacksons. Olive had never ridden along the Beech meadow road before, and she looked about with the interest and animation which youth gives to everything new.

"And how much family have the Jacksons?" she asked of the boy as they were slowly climbing a long hill near the end of the journey. "I had no time to ask Mistress Dawson about them."

"Well," said the boy, "there's Master and Mistress Jackson, and the two small children and meself; yes, and Margie Craig, she's there too."

"Margie Craig! That should be a Scotch name," exclaimed Olive. "Is she Scotch, and does she belong to them?"

"That I can't say," replied the boy. "She may be Scotch, but I doubt if she's any kin to them, though she calls them aunt and uncle. There she is now, that's Margie," he added, pointing with his switch as they drew near the farm-house.

A little girl of eight or nine years in a homespun dress and ragged shoes was going slowly from the kitchen door toward the pig-sty beyond the barn, carrying a heavy pail of swill. The small figure was bowed with the weight, and she crept along carefully, clasping the pail's handle with both hands and evidently afraid of spilling the contents.

"O, the poor little lass!" cried Olive. "The pail's far too heavy for the child. Let me jump off and help her."

The boy grinned, but shook his head. "Mistress Jackson wouldn't like that much," he answered. "Margie's used to such errands and it's little good meddling, I tell you."

Olive saw the prudence of the suggestion and said no more; but her look followed the child sympathetically as she crept slowly along, her little frock blowing out in the breeze and her feet slipping about in the ragged shoes.

Olive found the linen-loom set up in a front chamber of the farm-house. The room was well lighted and there was a pleasant view over the hills from the windows. Mrs. Jackson had shown her up the stairs, and though she seemed a cold, reserved woman, she was very civil and appeared pleased with the samples of weaving which Olive had brought. When she had selected a pattern and gone down stairs to her work, Olive began putting in the warp for the linen, thinking cheerfully of the neat and orderly appearance of the rooms she had seen below, and that a comfortable and profitable week's work was before her.

When she was at dinner with the family she saw Margie Craig again. The child was in the next room walking back and forth with Mrs. Jackson's baby, trying to keep it quiet while the family were eating. The baby fretted and squirmed about in the frail little arms and at last set up a loud crying.

"Bring the child in if you can't keep it still, Margie," said Mrs. Jackson, impatiently. "You're the unhandiest girl. Here, I'll take the baby and you may as well come around and get your dinner."

As Margie took her place at the table, Olive saw her face fully for the first time. When she lifted her eyes, Olive felt something like a shock of surprise. She could not imagine why their expression so puzzled and bewildered her. The face was strange, and yet startlingly familiar. There was a singular likeness to something she had known, and had known well, and yet was unable to recall.

As day after day passed and the dainty pattern grew in the loom under Olive's skillful fingers, her interest and wonder about the patient little drudge who bore burdens so unsuited her childhood became more intense. The Jacksons were not positively harsh or cruel, but they showed no tenderness toward the delicate child, and her life had little leisure or pleasure. The nearest approach to it was in the afternoons, when, the housework done, she brought her knitting up to the weaving-room and, entering timidly, seated herself on a little stool near Olive's loom. She did not talk much, but Olive's soft Scotch speech seemed to have a great fascination for her. When Olive was speaking, she would drop her knitting and watch Olive's face with an earnest, wistful look in her pathetic brown eyes, which one day attracted Mrs. Jackson's notice.

"Don't sit and stare at anybody that way," she said sharply. "Haven't you any better manners?" and Margie picked up her knitting-work again with a long sigh.

One day Olive and Margie chanced to be for a few minutes alone in the room. Olive was putting a new warp in the loom, so the room was quiet. As she bent over the work, she began to sing, in a low voice, a Scotch ballad.

Margie dropped her knitting and drew nearer and nearer as if charmed by the sound. When Olive reached the chorus, the child's voice chimed in with hers. Olive sang on to the end and, as she finished, turned and saw that Margie's little form was shaken with sobs and that her pathetic brown eyes were full of tears.

"Why, Margie, child, what's the matter?" she asked kindly. "And where ever did you learn that song? I never heard it outside of Scotland before."

Margie shook her head. "I don't know, Miss Olive. But I know it, I know it. Listen, it goes on like this," and she sung a few strains in a sweet but tremulous voice.

"Have you always lived here in America, Margie; and do you remember your father and mother?"

Margie shook her head again. "I don't know, Miss Olive," she repeated. Just then Mrs. Jackson came into the room, and caution prevented Olive from saying any more.

But the matter dwelt in her mind, and that night she could not sleep well. Margie's eyes with their strangely familiar expression were before her, sleeping or waking. In her dreams she was back at her old home in Scotland, and a face like Margie's, sometimes the face of a child and sometimes

"OLIVE OPENED THE HEAVY DRAWER."

that of a woman, was always with her. Never had her shrewd, practical, good sense been so puzzled as it was by the problem of Mrs. Jackson's quiet little chore girl with the Scotch name and New England speech. But something happened, a day or two later, that put in her hand a clew to the mystery.

It was nearing the time when she must go to fulfill her next engagement. It was near the last of November. The ground had frozen hard, and little Mark Jackson, who was running about in the field in view of Olive's window, was well wrapped up in shawl and leggins, and a red hood and comforter muffled his head and ears. Mrs. Jackson, with the baby, was sitting in the weaving-room, and Margie was in the kitchen washing the dinner dishes. Suddenly a scream from Mark rent the air. The clumsy little figure with the red headgear came waddling toward the door, and presently was heard clambering up the stairs. He burst into the room with a loud wail and held up his hand, bleeding from a cut caused by a fall on a piece of sharp stubble.

"Let me dress it, Mrs. Jackson," said Olive, starting up from the loom. "You have the baby."

"Well, if you will," replied Mrs. Jackson. "You'll find a roll of old linen in the upper drawer of the chest of drawers in your bedroom."

The great oaken linen-chest stood in one corner of the room where Olive slept. It was a massive piece of furniture, with deep drawers and drop-handles of brass. All the furniture and appointments of the Jacksons' house showed that they were fairly supplied with money, and their style of living was rather better than that of the other hard-working farmers of the neighborhood.

Olive opened the heavy drawer and found the roll of linen—old, soft pieces, most of them worn into rags, and well suited to the dressing of cuts and burns.

Suddenly Olive had a queer shock; the same sensation she had felt when she first saw Margie Craig's brown eyes. She had unrolled from the bundle the remains of a ragged baby cap, a little night-cap affair of finest linen, the pattern being of a quaint and delicate design—a pattern that had never been woven on the heavy loom of any New England farm-house.

The sight of the baby-cap and the linen pattern, which she recognized in an instant, though it had been more than three years since she had seen the

design, was a sudden revelation to Olive. She stood for a minute looking at it in uncertainty and surprise, until the voice of Mrs. Jackson calling to know if she had found the linen reminded her of the need of quick action. She hastily rolled up the tiny cap and put it inside her bodice; then, selecting a strip of linen for the cut finger, hurried back into the weaving-room.

The next day Olive finished her work for Mrs. Jackson and returned to the Dawson farm-house; and the next ship which sailed out from Massachusetts Bay for the old country carried a package addressed to Jean Maclean of the burgh of Dunkeld. A letter in the parcel read as follows:

"Dear Cousin Jean: I make haste to write you on a matter of importance, and beg you to do a great service. With this letter comes a child's linen cap. Drop everything you have in hand, I pray you, and journey at once to the Laird's house at Wynhall where I lived at service three years ago. Call for Mrs. Ruth, the housekeeper, show her this cap and tell her that a child who hath worn it, a child with the Laird's eyes and Lady Isobel's face and voice, is doing servant's drudgery in a farm-house in the Massachusetts colony. Nay, show her this letter and it will explain all to her, as I now explain to you.

"Mrs. Ruth will remember this linen-star pattern. She taught me to weave it, and well I remember the patience she had with me in the troublesome task. It was a pattern she designed, and I have never since woven it, nor seen it woven, outside the great house at Wynhall.

"Six years ago, the coming summer, the little Lady Isobel, the child of their middle age and their only one, was lost to the Laird and his good lady. It was believed that she was drowned in the river which runs swift and wild at the foot of Wynhall garden. She had strayed out from her sleeping room in her little linen night-robe and cap, with her doll in her arms, when her maids were at breakfast and they thought her asleep. They traced her little steps along the garden walk, and on the river brink they found her doll. For six years they have mourned her as dead, and the Laird's nephew lives in his house as the heir of Wynhall. Mrs. Ruth has told me the story many times. She wove the linen for the little lady's wardrobe when she was lying in the cradle. *Ask her if she knows this little cap.*

"Pray lose no time, dear cousin, in giving this message from your cousin.

OLIVE MACLEAN."

The bitter New England winter had passed and the buds of June were swelling to bloom before Olive Maclean could begin to hope for an answer to her message. It was slow work in those days to send and receive a message from the old country. She dared breathe her suspicion to no one, but as far as she could she kept a watch over the child and often found ways to make her life a little easier. She was much at the Jacksons' house in those times, for there was a great store of linen to be woven, and the thrifty, bright Scotch girl was too valuable an aid to lose. When she lightened the little chore-girl's tasks, when she took it upon herself to see that the child's clothes were warm and well-mended, when she took into her own willing hands the burdens that were too heavy for a child's strength, if the Jacksons grudged the interference they were too cautious to quarrel with one who was so shrewd and useful, and whose word and character were so highly respected in the country about. All the while Olive bore alone the weight of her great suspicion, and it was no light secret to carry.

The buds had swelled and blossomed and fallen, the Indian corn was ripening and the wild blackberry bushes were heavy with their ripe fruit, and still no word had come. Olive began to wonder if she had made a mistake. But at any rate she would care for and shield the child to the best of her power, for Margie's mildness and delicacy had wholly won Olive's heart.

One warm August afternoon they had climbed the hill to the blackberry pasture beyond the Jackson wood-lot and sat down to rest, after the hot walk, by the stone wall under a great elm tree. Here the air seemed fresh and cool, though the flowers were drooping in the sun and the grass was wilting on the heated hills. Margie had scrambled to the top of the wall and was fanning her flushed cheeks with a plantain leaf. The little sunbonnet, which Olive had made her, had fallen back from her head and her damp hair clustered in curly rings about her delicate face. "What a pretty little thing she is," Olive was thinking.

"Olive," said the child suddenly, "some one is coming. I can see a man on horseback, riding through the hollow. But I think he will take the other road."

"Sing, Olive, please," she said presently. "Sing another of the pretty Scotch ballads that you know."

Olive began to sing, and, as before, Margie's voice chimed in before she had finished, and the sweet notes sounded far along the lonely country road.

"How is it that you can sing those songs so quickly, Margie?" said Olive. "You must surely have heard them before?"

"I don't know—I really don't—Miss Olive. I can almost remember, but not quite. I wish I could,' replied Margie, shaking her head.

Presently she jumped down from the fence and spoke in a different tone.

"I see the man on horseback again, and he is—yes, he's coming this way. I saw him through the trees at the turn almost at the top of the hill."

Olive rose to her feet, and at the same time Margie sprang down from the wall. The rider came into view—a gray-haired man of fine presence riding a black horse. Olive gave a cry of surprise and recognition. It was the Laird of Wynhall.

But Margie! Her brown eyes had grown larger and darker, and the flush had faded from her cheeks leaving them quite white. Her hands were trembling and fluttering, and her breath came in gasps, as remembrance and recognition began to stir in her heart. The rider came nearer and nearer, he lifted the hat from his gray head, and then Margie darted out into the road before the horse with a wild, appealing cry: "Oh, daddy! daddy!"

OLIVE GAVE A CRY OF SURPRISE AND RECOGNITION.

How much of a share the Jacksons had really borne in the child's abduction was never fully known. They readily yielded up the child to her father, and they told a fairly plausible story, which may have been true; how as they were sailing for America the child was brought to them by a young Scotch gentleman, who had persuaded them to take her along. Having then no children of their own, they had consented, on the representation that the little one was fatherless and motherless. It was well understood that the child had not come to them without the weightier argument of a sum of money, sufficient to help them to a good start in the new world, and if they had felt any suspicions that all was not right they had certainly taken no trouble to investigate. They escaped without a strict reckoning; but when the Laird with his recovered daughter reached home his nephew had disappeared, nor was he ever seen again at Wynhall.

Margie, or Isobel, grew to be a sweet and gracious lady in the home of her fathers. She lived to see her children and grandchildren high in station and honor, both in Scotland and America. The story of Lady Isobel's abduction so long ago is still a bit of the family tradition; and we may be very sure that Olive Maclean's good service was not forgotten.

An Insect that is Bought and Sold.

J. W. DARROW.

The cochineal (*Coccus cacti*) is of interest to us because of its use in making scarlet dyes. It is found in the woods in hot countries, particularly in certain parts of Mexico and South America, its habitat being the plants of the cactus family. The female is the most important member of the cochineal household, as she is the color-producer. She is wingless, of a deep brown color, and her body is covered with a whitish powder. This little insect fastens itself to a branch of the cactus, and thrusting its beak into the mass it stays there

usually for life, sucking the juices of the plant. It increases in size rapidly and soon it is hard to tell it from a seed or berry. When the female is full of eggs she stops feeding, incloses herself in a white downy film which she spins for herself, and dies. But it is now that her usefulness really begins. Just before the eggs are laid the cochineal is fullest of the coloring matter which forms so important an article of commerce. The whole plant seems then to be laden with its purple harvest, and the myriad insects are brushed off upon pieces of cloth spread to catch them. Then they are speedily killed by hot water or on hot plates, and when dried are ready for the market.

How many of these little cochineal bugs do you suppose are required to weigh a pound? Seventy thousand! "Well," says some bright lad, "if it takes so many to weigh a pound the stock of cochineal dye-stuff must be quite limited." No, the cochineal industry is an extensive one. Large plantations of cactus are grown especially to raise the cochineal bug, and it is said that in a single year there have been imported into the United States alone nearly 2,000,000 pounds of these dried insects, valued at a round million of dollars. England buys an equally large amount, and France deals in them quite as extensively. As many as 1,400 tons of cochineal have been exported in the past when this industry was at its height, but the use of aniline dyes has lessened the trade considerably. The most recent statistics of cochineal imports show that the quantity annually brought to this country amounts from 500,000 to 600,000 pounds, valued at $150,000 to $200,000.

Girls on the Water.

EVA M. NILES.

As an exercise and pastime for women and girls, rowing is healthy, graceful and becoming. Some knowledge of the management of a boat should be acquired before a venture is made alone upon deep water. Nothing is easier than to upset a boat by thoughtlessness on the part of some novice, and one of the most fruitful sources of danger lies in two or more of the party standing up in the boat to change seats. A few simple precautions are all that are required to render boating perfectly safe, but these, like everything else, have to be learned, and it is desirable that the knowledge should be inculcated by a less severe lesson than by an upset or some equally hazardous predicament in which life is risked.

If you learn to row you should also learn to swim. It is greatly to be regretted that more girls are not taught the latter accomplishment. A visit to the seaside affords a favorable opportunity for practicing in salt water, in which the buoyancy of the body is greater and the effort required to keep afloat proportionately less than in fresh water. Swimming and the power to keep afloat are very easily learned, and if the learner will get some accomplished swimmer to explain to her the theory of natation and describe the functions of the limbs, the power of supporting and propelling the body in the water can be acquired, without further instruction, by any one who will practice persistently. Of course proficiency will be more quickly attained by lessons from an accomplished swimmer, and much may be learned by watching those who can swim.

The advantage of learning to swim does not lie in the power it gives of enabling one to swim any distance, as out of a hundred people who can swim fairly well probably not five when out of practice could propel themselves a quarter of a mile without physical exhaustion. The benefit is in the confidence it gives one in the water, and it is solely for want of this confidence that many lives are annually sacrificed. The horror of drowning is deeply rooted in the minds of all, and it so completely takes possession of any helpless person who finds himself or herself suddenly immersed that presence of mind is lost. The impending fate is apparently so near, and the danger is felt to be so imminent that it is practically impossible for one so situated to refrain from wrestling desperately with his doom. Hence commences a course of frantic struggles that are not only utterly useless in themselves but make it very risky, if not impossible, for any person, however good a swimmer, to render any assistance. Many instances have been known in which a powerful swimmer has gone to the rescue of a drowning person who, in his wild and senseless efforts, has not only thwarted the good intentions of his rescuer but by clinging to him with a desperate and fatal grip has carried him also to his death. When once the art of swimming has been mastered it gives to the swimmer a confidence in the water that was never felt before, and which is never afterward lost. There is a perfect consciousness of the power of being able to keep afloat in the water, and this, even if supplemented by little actual swimming ability, enables the swimmer to do the best thing, under the circumstances, to save himself.

Curiosities of Microscopic Writing.

AGNES CARR SAGE.

In the slow old days, when people had more time, fewer books, and, let us hope, stronger eyes than we of the nineteenth century are generally blessed with, certain scribes, skillful with the goose quill, delighted in microscopic writing, and literally gave to the world whole volumes "in a nutshell." Pliny states that Cicero once saw the entire Iliad of Homer contained in the shelly covering of a specimen of the forest fruit. By many this was long believed to be a fiction. They declared it was impossible; but that it could be done was proved conclusively by Bishop Huel of Avranches, in the presence of the dauphin and a royal company. He clearly demonstrated, with a sheet of paper and a common pen, that a piece of vellum ten inches in length and eight in width could be folded up and inclosed in a good-sized walnut shell. If finely inscribed with a crow quill, it would hold in breadth one line of thirty verses, and in length two hundred and fifty lines, thus making on one side seven thousand five hundred verses, and on both sides the whole fifteen thousand verses of the Iliad.

A still more wonderful curiosity was the little Bible in a walnut shell the size of a small hen's egg, an account of which has been preserved among the Harleian manuscripts, and which Mr. D'Israeli quoted as "a rare piece of work brought to pass by Peter Bales, an Englishman and a clerk of the Chancery." It was quite unreadable without a magnifying glass, but contained as many leaves as a large Bible, and as much reading matter on each page. The author of this tiniest book on record lived in the time of Queen Elizabeth, and, in 1575, presented her virgin majesty with the Lord's prayer, the creed, ten commandments, two short Latin prayers, his own name and motto, and the date, all written on a bit of paper the size of a finger-nail, and set in a ring of gold, covered with a crystal. By the use of spectacles the words could be clearly deciphered, and this work of the eminent writing-master was the wonder and admiration of the fastidious sovereign and all her ministers and ambassadors at Hampton Court.

Very much the same feat was that executed by John Parker, of Wingerworth, near Chesterfield, in Derbyshire, as late as 1823; for within the circle of a penny piece he succeeded in placing the Lord's prayer, creed, decalogue, nine collects, the grace of our Lord Jesus Christ, the name of the writer, place of residence, nearest market town, county, day of the month, and date of the year, all in words of full length, and with all the capital letters and necessary "stops," as well as the numbers of the commandments. These characters were legible to the naked eye, and a close calculator declares this piece of writing to be even smaller and more remarkable than that displayed in the microscopic Iliad or the microscopic Bible.

The contents of a thin folio outline the head and features of Queen Anne, which odd picture is about the size of a man's hand, and is kept in the British Museum. At St. John's college, Oxford, may also be seen a portrait of Charles I, entirely composed of minute written words, which, at a short distance, resembles the lines of an engraving. By close examination it will be discovered that the head and ruff are a truly religious work, being formed of the Book of Psalms, the Lord's prayer, and the creed.

The wee specimens of writing and printing that we are familiar with are principally confined to watch charms and ornamental pen-handles, and are extremely limited. If, however, any of my young readers writes a small, neat hand, and has a goodly stock of patience and perseverance, he might find it interesting to rival the scribes of old, and astonish his friends with his skill in microscopic writing. Don't do it, however, at the expense of your eyesight.

Another Watch for Somebody.

Our puzzle-solvers like watches so well that we have decided to offer for the first prize, this month, a handsome nickel watch, with stem-wind and pendent set. The cases are made of composition metal, which looks and wears like silver; and the watch is a good timekeeper. The usual retail price of this watch is five dollars. Either ladies' or gentlemen's size will be forwarded post-paid to the winner.

For the second prize, we will give either a gentleman's gossamer overcoat or a lady's waterproof circular. Each is sold for three dollars, and is a most useful garment, being proof against the severest storms. The prize-winner will be permitted to take any size made, and the article will be forwarded post-paid.

The third prize is a box containing six handsome nutpicks and a nut-cracker, each article handsomely chased and heavily nickel-plated—a beautiful gift well worth $1.50.

The fourth and smallest prize will be a checker and backgammon board.

These prizes will be awarded to those sending the best lists of answers to the puzzles printed below. Answers must be mailed on or before the 20th of this month to "Puzzle Editor AMERICAN AGRICULTURIST, 52 Lafayette Place, New York."

67. ANAGRAM.

I oil cab. U trap a hog. (The answer is one word.)

68. DROP LETTER PUZZLE.

—v—p—r—u—. (One word.)

69. CROSS-WORD ENIGMA.

My first is in head but not in nose,
My second in gullet but not in toes,
My third is in brain but not in chest,
My fourth is in arm but not in breast,
My fifth is in neck but not in lung,
My sixth is in mouth but not in tongue,
My seventh is in joint but not in ear,
My eighth is in blood but not in tear.

My ninth is in both nerve and bone, and my whole was called the nerve and bone of Greece.

70. SCRIPTURAL QUESTION.

Where do we read that certain postmen were mocked and jeered at when they delivered their letters?

71. DECAPITATIONS.

1. Behead a fish and leave 480 sheets.
2. Behead a cricket and leave to dress.
3. Behead to clutch and leave ready for reaping.
4. Behead a gift and leave boisterous and empty declamation.
5. Behead to droop and leave tardy.

72. CHARADE.

My first is a sharp-pointed rod; my second is to shun; my whole is a troublesome insect.

73. PERFECT HALF-SQUARE.

1, a broil; 2, a fish; 3, an affirmative answer; 4, a letter.

74. WORD-SQUARE.

1, Rains in very fine drops; 2, a person entering upon some public duty; 3, belonging to other persons; 4, one who betrays his trust; 5, the upper part of a lighthouse; 6, to devour voraciously; 7, a post-office in York county, Penn.

75. NUMERICAL ENIGMA.

My 4, 12, 9, 21 is to take effect; 10, 5, 16, 6 is a tent; 18, 15, 2, 1, 8, 13, 11 is to scour; 20, 14, 19, 3, 7, 17, 15 is a declaration of indebtedness. My whole is a familiar quotation from Shakespeare.

ANSWERS TO THE JULY PUZZLES.

53. C-ape, C-row, R-eel, D-apple, G-ray.
54. Coleridge, Shelley, Dryden, Bloomfield, Crabbe.
55. Combativeness.
56. Unnecessary.
57. Growth.
58. Latitudinarian.

WINNERS OF THE JULY PRIZES.

The first prize, for the best list of answers, goes to David Himrod, Sterling, Kan.; the second to M. S. G. Wilde, 17 Cherry street, Somerville, Mass.; the third to W. H. Sussdorff, Woodside, Long Island, N. Y.; and the fourth to Daisy Capern, Beecher, Will Co., Ill.

TIDINGS FROM THE BATTLE FIELD.

I took especial interest in the letter multiplication, and hope for more like it.

A. G. PORTER, Dutchess Co., N. Y.

Please accept my thanks for the exceedingly

nice spoons which came safely to hand to-day They will be very useful, and I consider myself most fortunate in obtaining them. Either of the three prizes was well worth working for.

B. TUZO, 46 Exchange Place, New York.

We think there is no paper like the AMERICAN AGRICULTURIST, and will say all the good words we can for it. M. A. PRESTON, Eaton Co., Mich.

An Old-Fashioned Coon Hunt.

W. H. H. MURRAY.

It was not a small wave of excitement which rolled through the neigborhood in which I was born when the announcement was made that a coon hunt was arranged, the high contracting parties being Uncle Daniel Norton, the miller, my father, and certain other choice spirits descended in direct line from Nimrod, that most ancient of hunters of whom history tells. And if by chance along with the announcement the statement went forth that David Hill was to come clear from Guilford town to join in the hunt, the excitement was intense. The significance of Mr. Hill's presence with the party was found not only in the fact that he was a genial companion and wise in hunting-lore, but because he was the owner of the two most famous coon dogs in the country. I doubt if soldiers on the eve of battle ever felt an excitement equal to that which thrilled through the little bodies of us youngsters who were born and bred in that favored locality when we learned that a coon hunt was decided upon.

And what a famous locality it was for boys who represented in their spirits, ambitions, and habits the genuine boyhood of the world! For there was Long Island Sound, with its oysters and clams, and mussels, and tautog and fishing seines, in which thousands upon thousands of menhaden were caught at one haul; and with them were there not shad, and bluefish, and flounders, and now and then a great black porpoise, or an enormous shark? And there were the salt marshes pierced with rivers and threaded with creeks, where we hunted the ducks and geese, plover and snipe in their season; and were there not rabbits in the bush and woodchucks in the fences; gray and red squirrels amid the chestnuts; quail in the stubble, and partridges in the swamps? And the wild pigeons—Whew! was there ever anything so hard to hit as a wild pigeon in flight? And then, the red foxes. I wonder if the fox hounds and the fox hunters are there now as they were forty years ago. Large dogs they were, with long ears, patched with black and white, with red spots over their eyes, and tanned muzzles, and voices like bells. Verily, I would go a good way to hear again the hunters' chimes among the hills, and see the men who followed those dogs—some long and lean; others short and stout; bronzed with tan, all of them, and all with the old-time hunting blood in their veins. Men who loved the chase; who loved nuts, and apples, and cider, and the midnight fire under the cliff, while they waited for the dogs to stir the game.

But the coon hunt—the meet in the evening; the preparation of ammunition; the charging of the guns, doubly wadded and doubly shotted; the jokes and the laughter; the drinking to luck from the cider mugs, and then the trail across the fields toward the woods in the bright moonlight; a spectral procession of men, and boys, and dogs—how well I remember it all!

"AWAY GOES THE COON."

At last the cornfield, in which the coon or coons are supposed to be feeding is reached, noiselessly surrounded, and the dogs are sent in. Heavens! what a roar from the dogs; what a rustle and crash through the cornstalks; and away go the coon and the dogs, the hunters and us boys, in one wild stampede, toward the swamp into which the coon has instinctively hurried.

A sagacious animal is the coon. When he goes abroad he carries all his wits with him, and the tricks that he practices on dogs and men are many and shrewd. More than once, as I can remember, the best of dogs and the wisest of hunters were baffled by his cunning. But it made little difference with the spirit of the company what luck befell. If the coon was captured, the woods rang with their cheers and the still night laughed with their mirth. If they did not capture him, each one could tell exactly why they didn't get him, and all turned homeward satisfied in mind and bubbling over with humor. And the homeward trail—the moon lying low in the West; the East reddening with the fires that morning was kindling; the stars blinking drowsily overhead; the hoar frost on the fences, and here and there the call of a bird piercing the frosty air!

I have hunted far and wide since those days, and have found game on many waters and in many woods—larger and nobler game it would be called. But no bit of sporting experience stands out in memory more clearly outlined than the old-fashioned coon hunts of my boyhood days.

A Nut-Cracking Bird.

MISS H. E. SMITH.

In the islands of the Malay Archipelago is found the great black cockatoo, whose special food is the kernel of the kanari nut, the shell of which is said to be harder than that of any other nut, and to protect a kernel of the most delicate flavor. The kanari tree grows to a great height and bears a fleshy fruit which incloses an extremely hard shell of glass-like smoothness of surface. Within this shell are from one to three kernels covered with a thin skin; when this is removed the nut falls into a number of irregular flakes of snowy whiteness and delicious taste. The fleshy part of the kanari fruit is eaten by many birds, particularly by the large wood-pigeons, but only the black cockatoo is able to get at the nut, which it does by the great strength of its immense, sharply-pointed and hooked beak. Taking a nut endwise in its bill and keeping it firm by a pressure of the horny end of its tongue, the cockatoo cuts a notch across the shell by a sawing motion of the sharp edge of the lower part of the beak. This done, the bird takes hold of the nut with one foot while biting off a piece of a thick leaf; this it wraps around the nut to prevent the glassy shell from slipping, while it uses the upper part of its beak to hold the nut and the under part to insert in the notch already made and wrench off a piece of the shell by a powerful nip. Again taking the nut in its claw the bird inserts the very long and sharp point of its bill into the hole just made and picks out the kernel which is seized flake by flake by the horny end of the long and flexible tongue. More time is required to tell about this nut cracking than the bird takes to perform the operation, for the cockatoo is a very rapid feeder and will consume a great many nuts in an hour.

FROM NEAR AND FAR.

A Family Garden in Kansas.

The question is often asked, "How large ought the family garden to be?" My family averages six persons. I devote to the vegetable garden an oblong square—71 by 144 feet exact ground cultivated—less than one-fourth acre. The soil is rich bottom land; has been cultivated twenty years, nine of them under my ownership. Four years ago I gave it a very heavy dressing of stable manure, and with weed seeds enough in it to seed a large farm. Since then I have used solely a home-made poudrette and hen manure. Of the last, I covered three-fourths of the garden with a heavy coating, carried out weekly through the winter, and broadcasted at once. The poudrette I used as a special fertilizer. Within the above space there are three large apple trees and a dozen currant bushes.

I have growing now, of seed onions one bed 64 square feet and one bed 48 square feet; one bed of top-sets of 80 square feet; one bed of early peas 48 square feet; four rows of peas each 35 feet long; eleven rows of potatoes full length of garden. On about the same space I grew last year upward of 40 bushels. I dug this year the first mess of Early Ohio potatoes May 27, fifty days from planting, beating my own record by three days. One row of bush beans and one row of pole beans, each 72 feet long; two rows of beets 30 feet; two rows of parsnips 15 feet; four and a fourth rows of sweet corn 144 feet; 300 cabbage; 100 cauliflower; 125 celery plants; 50 tomato plants; 19 hills of cucumbers, and 11 hills of watermelons. Of spinach, lettuce, and radishes, I have as much as two families could use. In addition, I have a few egg plants and peppers for mangoes, etc.

I grow all my own plants except sweet potatoes, and have given away fully one thousand cabbage and cauliflower and several hundred tomato plants this year. My fruit garden is but two years old, as a specialty, is 60 by 70 feet, and contains 16 peach trees, two cherry, 50 raspberry bushes, 12 grapevines, and a strawberry bed about 50 by 60 feet. The peach trees were planted as much for shade and as a windbreak as for fruit. The grapes are only one year old, grown from cuttings by myself, and both the grapes and raspberries are trained to wire trellises. As a money investment, I think it would be no hard matter to sell the growing crops at maturity for $100 in our markets; while to the family it is more than one-half of its annual supply for the table. It will be observed that, from the manner it is laid out, the vegetable garden can all be cultivated with a horse. I use the diamond or heart-shaped hoe, and it was through the AMERICAN AGRICULTURIST my attention was called to it. It is a splendid tool in the garden and requires much less physical labor to operate it than the square hoe.

A. G. CHASE, Leavenworth Co., Kansas.

Failure of the Delaware Peach Crop.

For thirty years the Delaware Peninsula has furnished a large portion of the peaches shipped to Eastern markets, and especially to Philadelphia and New York. At times the shipments have reached three hundred carloads a day, taxing the railroad to its utmost capacity to transport the enormous crops grown, and even producing a glut in the market. This year we have not had a single carload, and will not during the entire season. Such a thing never occurred before since peaches first became a staple on this peninsula. The loss of the crop is a severe blow to the people of the State at large, and especially to the growers, who have largely invested in lands and orchards. A medium crop would give them five million baskets, representing a cash value of at least one million five hundred thousand dollars. A half crop, or two and a half million baskets, would represent a million and a quarter in dollars, the price being increased as the crop diminished in quantity. This shows at a glance the pecuniary loss to the people of Delaware by the failure of the peach crop—nearly eight dollars to each individual and nearly forty dollars to each family of the entire population—but, as it is confined principally to the agricultural class, it represents a loss at least double that to the farmers. But they are not the only ones affected by the failure of the peach crop. The thousands of people in New York, Philadelphia, and Boston, besides scores of other cities, will feel keenly the deprivation, for no other fruit can take its place this season of the year. Besides, other fruits are also unusually scarce. Several causes have been operating of late years to reduce the quantity of peaches raised; but the principal one this year was the mild winter—or rather the absence of winter—last season. During December, January, and February there was neither snow nor ice. The grass remained green, and flowers bloomed all through those winter months. Apricots were out in blossom in January, and peaches a month later. Then followed cold rains and severe frosts in March, which effectively killed the entire crop, so that in orchards of ten thousand trees not a peach was left. Of apples, pears, and grapes the failure is nearly as complete, and there will be none whatever for market.

J. A. FULTON, Kent Co., Del.

Climate in Florida.

Here, for the months of June, July, August, and September, our maximum hardly ever falls below 80°, or the minimum below 70°. The usual range for these months is 70° to 90°. For the months of April, May, and October, the maximum seldom falls below 70°, and the minimum seldom below 60°. These three months, in point of temperature, correspond very closely to the last half of May and the first half of June in New Jersey, though the mean temperature for the three months is somewhat higher here. For the months of February, March, and November, the maximum seldom falls below 60° or the minimum below 50°, while for December and January the maximum seldom falls to 50° or the minimum to 40°. There is no guess work about this, as I have before me a daily maximum and minimum record since January 1, 1882. Since that date the maximum and minimum of each year has been as follows:

	MAX.	MIN.
1882	94 deg.	36 deg.
1883	96 "	40 "
1884	92 "	34 "
1885	94 "	38 "
1886	92 "	26 "
1887	95 "	35 "
1888	96 "	34 "

From this it will be seen that this Indian River country has a remarkably even temperature. But these figures do not express the delightful coolness of our ocean winds, that for six of the warmest months blow constantly from the Atlantic.

April of this year was unusually cold, the maximum falling below 70° five times, and the minimum below 60° six times, while the mean for the month was nine degrees below the normal for six years.

Here are a few facts bearing upon our crops: 1. Several of the oldest orange groves in the State are in Brevard county. 2. All of the famous "Indian River oranges" are grown in Brevard county. 3. In no other part of the State are orange groves so remunerative as in Brevard county. 4. The annual crop brings to the county about ten times as much money as any other single product.

I have lived in ten of these United States, and have never seen a region where human surroundings were more conducive to health and long life than this Indian River country.

JAMES H. WHITE, Brevard Co., Fla.

The Agricultural Situation in Iowa.

The term "West" has had quite a varying application within the memory of the writer. I was born near the same time and place as Gen. Garfield. In 1837 I moved via the Ohio and Mississippi rivers to Iowa. My uncle here built the first mill in the State. In 1840 my father bought a "squatter's claim" on a fertile farm for less than nine cents per acre. Now I live on a farm, naturally about half as good, which cost me $135 per acre. The land I now live on was then owned by Indians. The climate of Iowa has changed somewhat within my knowledge, but not quite so much as society and our methods of farming. We used to grow peaches successfully here, but now it is well known that it would be folly to plant them, or even plums of the European species. Our experiences in other fruits have been equally variable. Upon two or three occasions winter would prove so disastrous and discouraging that we gave up nearly all hopes. Then the prospects would brighten, and occasionally we have apples and cherries enough for home use. Berries are always a success except in a very dry season. Our far inland location explains the perverse condition of our climate, while, on the other hand, a location near large bodies of water insures that humidity of atmosphere and more equable temperature necessary to successful fruit culture. Our experience with grass and grain has also been variable. It costs twice as much labor now to raise a given number of bushels of corn as it once did. Apparently there have been cycles in which winter wheat would be a success, and then came failure. The successful period is now upon us. Tame grasses are a decided success, and grazing and dairying are our "best hold." Improved live-stock is also widely popular and successful with us, and yet there are many old fogies even in this. The sheep interest would be doubled if it were not for the pusillanimous dog, and if it were quadrupled we would be the gainers. Our greatest drawbacks are in trying to cultivate too much land; in permitting too many thistles, docks, and other noxious weeds; in the washing away of soil and forming gullies on hilly land, and the high wages for hired labor compared with the low prices of produce. O. MOFFET, Wapello Co., Iowa.

Winter in the California Mountains.

I live in the coast range mountains, and I have had some lively experience. About the 10th of December it set in snowing, snowed almost daily until the middle of January. The 16th day of January the snow was three feet one inch deep all around my house. My neighbor's barn was crushed in, killing three cows and four calves instantly, bruising the rest severely; several died afterward. By the beginning of February the snow had almost disappeared, when it set in anew, never stopping until it reached over three feet. Then a famine threatened part of the neighborhood. Rio Dell is our nearest postoffice and store, sixteen miles from my place. Six of us started for that place on snow-shoes. To get there we had to cross the Monument hill, some 6,000 feet high. There the snow was from six to ten feet deep; barns, houses and settlers' cabins crushed in all along the route.

To my knowledge two men froze to death in my immediate neighborhood. In Eureka, the county seat fifty miles further north, they had only a few light sprinkles of snow which always disappeared as soon as the sun rose.

California is a large State, and while the grass is green and the flowers blooming all the year in some places there are others, and sometimes not over twenty miles distant, where it freezes almost every night in the year.

The land on my place is partly covered with tan-bark, oak, maderone, pines and white thornbrush. I am clearing the land as fast as I can, burn it over and seed it to orchard grass, cheat or chess and timothy for pasture; the grass does fine, but I notice that poison oak and blackberry vines are trying very hard to get the best of it. Furthermore, the oaks, maderones and white thorn stumps I have been sprouting every three or four months regularly, but the more I sprout the thicker the sprouts appear. Old residents tell me: "You can not kill those stumps unless you grub them" (from two to six feet in diameter). The land is good, but being 2,000 or 2,500 feet above the sea and very hilly it is good for nothing but pasture and in spots for fruit trees. There is any amount of underbrush besides.

MAXIMILIANO CATENDO, Humboldt Co., Cal.

Among the Pueblo Indians.

The Pueblo (town) of Acoma is twenty miles from Cubero station, on the Atlantic & Pacific railroad. It lies at the head of a beautiful and very productive valley which slopes toward the northeast. The Pueblo is built upon the summit of a precipitous mesa, which rises perpendicularly on all sides to a height of nearly three hundred feet. In the dim past, danger of some kind caused the chiefs of this tribe to choose this almost inaccessible place as their permanent home.

The two scenes in the illustration are from photographs taken below the plateau on which the town stands. The man in the right-hand view, holding a hat, is almost directly beneath the houses nearest the bluff. The high rocks in the upper view are utilized in a number of ways by the Indians. The high point is their favorite lookout, and at the moment the exposure was made I was lucky enough to catch two vedettes. Between the rocks are large and small spaces. The larger are used for stock-corrals. Here they pen their herds of sheep, goats, and ponies. Within the smaller crevasses they make their woodpiles. At the base and higher up is stored their corn fodder; they also make their granaries here, and in our rambles through the defiles we found several piles of corn and a few sacks of oats and wheat. There are several ascents to the village, but no elevators, and, choose one of

the other, it requires the exercise of muscle to get there.

In some of the openings between the rocks are steps hewn in some places; at others stones are laid one upon another in such a way that an active person can climb up. The route chosen by our guides was by the burro trail. This leads through a huge defile, and was filled from base to summit with fine white sand. The wind piles the sand to the middle of the defile and forms an imbankment very much like a railroad dump, only that it is much narrower on top and is at an angle of fully forty-five degrees. The path follows the cone of this huge sandbank. It is barely wide enough to walk single file—true Indian style—to the top. At times the high winds sweep these approaches clear

ROCK CORRALS.

of sand. Then the only ascent is up the steps until such time as it is kindly blown back again. This happens as many as four or five times each year.

Reaching the top at last, after many breathing spells, we are met and welcomed by his excellency the Governor. We explain to him that our object is to take some views of the curiosities of the place, and would like to begin by taking himself and house. To this he reluctantly agreed. Here it may be stated that all Indians in the West are superstitiously opposed to having their pictures taken. The Governor is pacified with the promise of a picture for himself and grants us the liberty of the town.

The mesa upon which the Pueblo stands does not cover an area of more than eight acres, and the buildings probably not more than three acres. The Roman Catholic faith has the strongest hold upon these people, though other beliefs are professed by some. They all, without exception, have a religion distinctively their own, which never gives place entirely to any creed. The writer has seen the Pueblos at Laos, Landia, Isleta, and Laguna, but the Pueblo Acoma is more curious than all others. The houses are built with doors at the top, and entrance can be had only by climbing ladders.

The Acoma Indians are self-sustaining, though they receive now and then from the Government a donation of wagons, harnesses, plows, hoes, etc. They use them in a haphazard, spasmodic way, but do not seem to realize their true value. With the wagons they essay to haul wood, but can make more headway with a pack-train of burros. They take kindly to the hoe, and make it valuable to them in every way. With the field hoe they plant corn and cultivate it. After flooding the land from the acequia or ditch, they dig holes in rows and plant the corn, six to ten grains to the hill. After a few days they water the land again, using the hoe to guide it evenly over the field. When the plants are up a foot or more they chop around them once; afterward they weed once by hand, and their care of the crop is over until harvest time. Result, a fine crop of fodder and any number of worthless little nubbins, which they call maize.

Oats, wheat, barley, and other crops are planted and cultivated in much the same way. To the acreage planted the yield is ridiculously small. They have the happy propensity of making their necessities fit their circumstances, which is, after all, the true philosophy. A tortilla (in soldier parlance, a flap-jack) three times a day, greased with a little mutton tallow, and on extra occasions a piece of dried meat or tasajo is as good as they wish. Of the masses this is strictly true; but there are a few of the principal men or chiefs who have herds of ponies, sheep, and a few cattle. These few hold the masses in almost absolute peonage. They have beds to sleep on, chairs to sit at table, and plates to eat from, and even knives, forks, and spoons. Most of them are happy in the ownership of a blanket, a sheepskin, and a burro. In dogs they are all rich. In every direction numberless worthless curs are to be seen. How they live is a mystery. To steal a dog is a religious duty, and the writer has to record the loss of a faithful shepherd on this trip, the friend and companion of hundreds of miles travel, and the wakeful guard in many lonely camps. The horses of the Acomas are small but very hardy animals; of no particular beauty, but of wonderful endurance; often cantering fifty or sixty miles a day for a week or more at a time, with nothing to eat except grass, cropped at the end of a lariat at night. The wealth of the tribe is in sheep. They own a vast number of them and have good and sufficient range for them on their own reservation. Those I saw were of very inferior breed. The

BELOW THE PUEBLO ACOMA.

ACOMA INDIANS.

full-grown wethers would not average over thirty pounds dressed, and three pounds of wool is considered a large clip. We noticed a few animals that were possibly at one time swine, but they have been allowed to develop snout and legs to such an extent, and are so lank and ugly, that an Eastern pig would feel insulted to be classed in the same family.

No headstones or marks are placed over the dead, and they have no particular Campo Santo or burying ground. The Acomas and coyotes (wolves) are firm friends, the latter roaming in immense packs over the reservation unmolested. We will long remember the ghastly serenade they gave us as a farewell the evening we drove away from the Pueblo Acoma.

N. GENTRY, New Mexico.

Down in Dixie.

The heavy freeze of March last, after the unusually mild winter, did great damage to all vegetation which was putting forth at that time. It killed everything in the gardens, and nearly all the small grain. Peach trees were nearly all dead, or in a dying condition from the excessive crop of last year, and the cold snap finished them. The winter in this section was by far the driest and warmest ever known in the history of the county, and the dry spell continued until late in the spring. Farmers are trying to get down to some effectual method that will make the farm self-sustaining; the grasses and clovers are being tried. Bermuda and Johnson grass hold their own the best of any, but are so difficult to eradicate, and also to keep within bounds, that the farmers are reluctant to take hold of them. Grape- and small-fruit growing is attracting quite a number of people from different parts of the United States to this and adjoining counties. Griffin, the county site of this county, is now lighted by electricity. It has a population of 5000. It has three railroads, two of which pass through and one starts from there and runs to Carrollton, sixty miles. This county also has an experimental farm.

J. B. BUNTYN, Spalding Co., Ga.

In the Ozark Mountains.

Carroll county is in Northwestern Arkansas, and is noted for its wonderful health resort, Eureka Springs. Thousands of people visit there every year in search of health. The city is situated high up in the spurs of the Ozark mountains, 2000 feet above the sea, and has a population of about 6000. The surrounding country is rough, but nowhere else do all fruits and vegetables grow to such perfection. Plums, blackberries, raspberries, huckleberries, early peaches and apples are all raised. The berries sell at $1 per crate of 24 boxes. There being no cannery, all fruit is cheap. The rivers are all clear as crystal, and full of fish, and the woods are full of deer. The climate is mild, seldom ever reaching zero. This city has an average of fifty visitors daily, from all parts of the world. Land can be purchased for $5 to $40 per acre.

J. O. MELONE, Carroll Co., Ark.

P otato-Growing in Cuba.

Large quantities of potatoes are now grown here and shipped to the United States. The planting is done from October to December. The tubers ripen in about eighty days from planting. The Peerless is the favorite variety, as it yields more large potatoes than any other we have tried; but the Beauty of Hebron and the Early Rose are also planted to some extent. All the seed used comes from New York State. We plant in drills three feet apart, about one foot in the rows, using sets of single eyes. As much as twenty barrels of potatoes have been raised from one barrel of seed, but the usual average is not over six barrels from one barrel of seed. The principal difficulty in growing potatoes here is the blight, which seems to be on the increase, and in unfavorable seasons is apt to destroy the entire crop. Our market season is in January and February; what is not needed for local markets is shipped to New York.

THOMAS W. BETHEL, Cuba, W. Ind.

SCIENCE IN FARMING.

Gleanings from the Bulletins.

ILLINOIS, No. 9, pages 40. Under milk and butter tests and the composition of milk the "Short method" was found very satisfactory. Milk received at the same creamery varies greatly for the same day; in one instance from 3.07 per cent of fat to 4.75 per cent in another sample. Milk of different cows varies greatly. The average milk at a factory changes with the season. Thus the June milk may be richer in fat than that of July. In first-class butter there is about eighty-five per cent of fat, ten of water, and the balance is mostly ash. The lactoscope proved a very efficient and simple method of testing milk. The second part of the bulletin is occupied with results of comparative tests of corn fodder and ensilage in feeding yearling calves. The animals fed the ensilage ate more and required more water-free substance to make a pound of increase than those fed the corn fodder. The reason for this is threefold. The protein substances in the ensilage had undergone change, and the muscle forming constituents were reduced one-third. The heifers upon ensilage consumed seven pounds more water daily than those on corn fodder, and this excess of water was a source of loss, that is, it took work to eliminate it. In the third place ensilage relaxes the bowels and the food passed through more quickly, and hence less was digested. The value of a grain ration for young cattle in pasture was experimented upon with the following results: The increase rarely repays the cost of food and labor. If the grain is unground it is essential to have pigs follow the cattle. To secure the greatest gain of the animal the pasture must not be fully stocked, but for the largest gain per acre it should be fully stocked. Add grain always before the grass fails in autumn. Therefore, the sum of the results is that for Illinois the greatest profit comes from letting the young cattle get all their food from good pastures not overstocked.

KANSAS. Second Annual of Horticultural Department, pages 80, nine plates. The work of the year was with garden beans, peas, tomatoes and potatoes, and observations upon bean insects. Ninety-one kinds of beans were tested and a full descriptive list is published with a classification of the varieties. This is a most commendable work, as it lays a solid foundation upon which varieties must rest, and will lead to the overthrow of new sorts that are only new in name. The Limas receive particular attention in six full page plates showing pods and leaves of two-thirds natural size. Under peas 137 sorts are tested and classified. Both with the beans and peas we have a striking illustration of how some outside influence may come in unwelcomed, and frustrate the experiments. In both cases it was fungi that interfered with the work; with the beans a rust, and with the peas a mildew. Of the bean insects the bean weevil is the most evil, the damage averaging from seven to fifteen per cent. Contrary to the current opinion the germ of the bean is very often eaten so that germination is prevented. If the weevil is bad it is best to buy seed from a distance where the pest is less numerous. Several methods for destroying the insect were tested and the best proved to be the use of bisulphide of carbon. This is a liquid that produces a vapor of great pungency and is highly explosive, and therefore must be used with the greatest caution. Place the beans to be treated in a tight box with the remedy. There is a leaf beetle quite troublesome. The best treatment is with pyrethrum powder puffed over the infested plants.

KANSAS, No. 10, pages 14. This pamphlet is upon the cone-bearing trees for Kansas planters. The following in the order named are recommended after a wide experience: red cedar, Austrian pine, Scotch pine, table mountain pine, dwarf mountain pine, pitch pine, Southern yellow pine, white pine, Norway spruce, white spruce, Colorado blue spruce, Douglas's fir, silver fir, Siberian fir, arbor vitae, Siberian arborvitae, deciduous cypress, gingko, and the European larch. The list of failures is a longer one. Suggestions are given to planters. Remove evergreens in the spring just before the buds open. Evergreens may be pruned and especially newly transplanted trees. Prune the side branches, but not the leading or topmost shoot.

MISSOURI, No. 11. Texas Fever, pages 60 and one large plate. This bulletin is by the veterinarian, Dr. Paquin. The germs of the Texas fever are in some soils, grasses and pond waters of the Southern States, while the virus is in liver, spleen, kidneys, blood, urine and fœces of the animal, and are carried by the latter from place to place. Ticks may aid in the distribution. The period of incubation or growth of the symptoms after inoculation is from eight to twelve days. After thirty days from the time the cattle leave the infectious soil they are not dangerous. This gives the time limit to the quarantine that should be enforced beyond the fever line. Cars can be disinfected with steam, chloride of lime and corrosive sublimate. Inoculation has been successful and may prove a general practice. Horses shipped North have taken the fever into new localities. The virus is virulent at the North only during the warm months. Southern calves receive the germs before birth from their mothers, and resist the disease from this natural and gradual inoculation.

MISSISSIPPI, No. 12. Cotton-leaf worm pages 4. This contains a description of a method of destroying the cotton worm which is by using Paris green dusted over the leaves. Fasten a small sack to each end of a five-foot pole so that the pole and sacks can be carried on horseback, and a row be dusted from each sack. There are machines made like a two-wheel sulky by means of which seven rows can be dusted at once. The chief point is to have the poison distributed evenly upon every leaf. The poison may be used without any flour mixed with it, and about two pounds are required per acre. The workman and the mule need a bath at the close of the operation. Promptness is the most essential thing in dealing with the cotton-leaf worms.

NEVADA, No. 9, pages 4. A serious rose pest consisting of an insect that burrows into the buds is fully treated. As the borer is the larva of a night-flying moth it is suggested that lamps be employed to attract the adult insects, and then entrap them in some sticky liquid surrounding the base of the lamp. Various insecticides sprayed upon the bushes have proved ineffective.

NEW JERSEY. Tenth Annual of the State Station, 190 pages. This is chiefly chemical in its nature, the work falling under the following three heads: Fertilizer statistics, that is the quantity and value of fertilizers used in the States and a comparison of the year's trade with that of the six preceding. Under the second head is the quality of the fertilizers used, which includes the tabulation of hundreds of analyses for one or all of the following three ingredients, namely: nitrogen, phosphoric acid and potash. Under the third head are treated the agricultural values of fertilizers; it includes the reports upon field experiments. Thirty-two thousand tons of commercial fertilizers were used in the small State of New Jersey last year, which is not far from that for the year previous. This means a trade of $860,000 worth of artificial plant food. The following conclusions are drawn: That it will pay for farmers to study the bulletins upon fertilizers carefully; buy only of those who sell good fertilizers and what is represented, and third, study the wants of the soils by testing various brands of fertilizers. Field experiments were carried out by the Station upon tomatoes, and they showed that nitrate of soda is particularly valuable for this crop when applied in the presence of an excess of mineral elements in the soil. The field experiments with alfalfa for the third year gave per acre twenty-two and a half tons of green fodder for the season. The broadcast plots did better than the drilled. The second annual of the New Jersey Agricultural College Station, 140 pages, is bound with the above and contains the reports of work done by the biologist, botanist and entomologist. The work of the first is upon seashore life and principally the oyster, which is a large item in New Jersey products. The botanist has paid particular attention to the diseases of the cranberry of a fungous nature, while the entomologist has prepared a long and fully illustrated report upon the insects injurious to the cranberry.

OHIO, Vol. III, No. 4, pages 40. This consists of several separate short articles mostly upon insects injurious to vegetation. Considerable space is given to the general subject of spraying, in which several of the leading pumps are figured and described. The following insecticides are treated: Paris green, London purple, hellebore, pyrethrum, and kerosene emulsion. The crops sprayed with most advantage are: apples, plums, cherries, peaches, currants and gooseberries, cabbage and potato. London purple and Paris green act as direct poisons when eaten by insects. Kerosene emulsion and pyrethrum close the breathing pores of the insects; hellebore acts both ways. The following insects are illustrated: The bark louse; tree hopper; white grub, cucumber beetle; corn louse and bot fly. Several fungous diseases of crops, as potato rot, apple scab, and fruit rot, are described and treatment recommended. The bulletin closes with an article upon collecting and studying plants, in which methods of preserving specimens are given, and other facts for the beginner.

OREGON, No. 5, pp. 32. The greater part of this bulletin is occupied with short illustrated articles upon various injurious insects with remedies for each. Professor Washburn is convinced that one or two thorough sprayings of apple trees at the proper time will save the fruit. The grain beetle received much attention and the following conclusions were obtained. Stored wheat should be kept below 50° F. Camphor vapor is not effective. Bisulphide of carbon is fatal to the insects, and when properly employed is not injurious to the grain. Methods of disposing of gophers and rabbits were tested, as traps of various sorts and several poisons. Strychnine placed in a potato is very effective when left in holes. For rabbits, use a half teaspoonful of strychnine, two of fine salt, four of granulated sugar; shake and spread upon boards to harden. The rabbits lick this mixture eagerly and perish.

PENNSYLVANIA, No. 11. Indian Corn as Grain and Forage Crop, pages 16. In the central and northern sections of the State the smaller dent varieties should be grown when grain is main object. Large dents are best for ensilage. Of the ensilage varieties some excel in yield, others in amount of dry matter. Breck's Boston market and Burrell and Whitman's ensilage are among the best sorts. Farmers are recommended to test their seed corn by artificial germination. Lower results, as a rule, are obtained in the field because some grains will germinate but fail to grow. A self-husking sort had the lowest yield. One-half of the fodder material was found in the ears; one-fourth to one-third in leaves and husks. Fully twenty per cent of dry matter is gained by permitting the crop to mature in the field.

TENNESSEE, Vol. 3, No. 2. Tests of Crops, pages 16. Flint corns are not recommended for the State, as the yield of fodder is small and the corn not so good as the dents. Sweet sorts are a failure because of the corn worm, and secondly, this class grows only poorly in Tennessee. Of oats, the so-called "rust-proof" sorts are best. Potash proved of much value for oats. The Tasmanian wheat yielded the best, and "Nigger" next. Both are bearded varieties. In experiments with fertilizers on clover the general result was obtained that to arrive at satisfactory conclusions the experimental plats must be treated through several seasons. Some kinds of the best fertilizers do not exert all of their influence the first season. This is especially true of such substances as cotton-seed meal, a leading fertilizer in the Southern States.

U. S. DEPT. OF AGRICULTURE, No. 11, Section of Vegetable Pathology. During 1889 treatment of plant diseases under this Section have been carried out in nine States, the results as a whole being very encouraging. The season was particularly favorable for the growth of molds, rusts, and blights of all sorts. The diseases under treatment are scab, rust, and bitter-rot of the apple; powdery mildew, downy mildew, leaf-blight, anthracnose, and black-rot of the grape; leaf-blight of the pear; leaf-blight, rust, and fire-blight of the quince; leaf-blight of the strawberry; rust and leaf-blight of the blackberry; rot and blight of the potato, tomato, and melon. A summary of volunteer reports on vine diseases is given, from which it appears that nearly every one who followed the directions saved the greater part of their crop. The Bordeaux mixture is still the most reliable remedy; however, the ammoniacal carbonate of copper solution in ordinary seasons may be the cheapest and most effective. One great advantage over the Bordeaux mixture is that it does not spot the fruit, which is a matter of importance. In Wisconsin and Michigan apple-scab was treated with satisfactory results. At a total cost of twenty-five cents per tree, the yield of fruit free from scab was from sixty to seventy-five per cent greater than on untreated trees. The bulletin concludes with an article on the amount of copper in wines made from treated grapes, and the hygienic questions involved. Several full-page engravings are presented.

FARMING IN FOREIGN LANDS.

A German shipping company has contracted to carry 10,000 head of Canadian store cattle from Montreal, Canada, to Aberdeen, Scotland.

The English Shire breed of horses has become very popular in the German province of Hanover. Hildesheim is the headquarters of the Shire-horse enterprise.

Sugar making in India has so far proved a failure, after having engaged the attention of the authorities and of capitalists since the beginning of the century.

In the Crimea and other places along the coast of the Black Sea cotton culture is now being experimented with. The seed for this purpose has been brought from America and parts of Asia.

Crops of 107 and 108 bushels of oats per acre are reported in some districts of New Zealand. From the same colony come reports of a single turnip three feet in circumference, weighing twenty-eight pounds.

The English breeders of the Wensleydale long-wooled sheep have organized and incorporated a flock-book society which has a membership of 127. The first volume of the flock-book will soon be ready for issue.

A disease known by the somewhat indefinite name of "horse-sickness" has made great havoc among horses in Cape Colony, Africa. It is a blood disease caused by miasma, but the pathology is quite distinct from anthrax.

Castor-oil is now produced in considerable quantities in Hungary. The experiments made hitherto have proved highly satisfactory and, to judge from the results already obtained, Hungary is likely to be able to compete with British India as a castor-oil producing country.

Ramie is one of the staple products of western China. The stems when ripe are cut down, made into bundles, and carried from the fields to the house of the grower, where they are steeped in water, and the bark, with the fiber, removed by hand.

The *South African Agriculturist*, of Wynberg, Cape Colony, pronounces the Agricultural Department of the United States to be "the model department of agriculture in the world," and devotes an editorial of several columns to explanation of its workings.

It is estimated that there are 45,000,000 fowls in France, of an average value of fifty cents each. The sale of fowls and eggs brings to the breeders annually between sixty and seventy million dollars, divided nearly equally for eggs and for fowls consumed as food.

The Highland Cattle Society, of Scotland, has brought out Vol. 4 of the Highland Herd-Book. It contains the records of 133 bulls and 502 cows and heifers. Breeders of Highland cattle are looking to the United States and Canadian provinces of the Rocky Mountain region as a future market for the breed.

A disease called "spinal apoplexy" has been somewhat common among the lambs in some districts in England. The lambs become weak in the back, fall down, and are frequently unable to get on their feet again. Professor Wrightson states that veterinarians are puzzled over the matter, and are unable to suggest a remedy.

The southern counties of England are suffering from a plague of mice which seems to be as bad as the rat-plague of the northern parts. On a farm in East Kent two stacks of wheat when opened for thrashing were found full of mice, 5,000 in one, and 3,000 in the other. Of course, they had made havoc in the grain, taking fully one-third.

The rabbit pest in New Zealand is unabated. The efforts put forth for the extinction of the nuisance, which have cost a large sum, have completely failed and the rabbits are as numerous and destructive as ever. It is now proposed that the government shall abolish the rabbit department and offer a uniform price for all rabbit skins.

In a recent speech at an agricultural society's banquet, Lord Derby remarked that the bottom had been touched, and farmers knew the worst. The prosperity of fifteen years ago would not return, yet some considerable improvement might be expected. Those who buy or lease lands now will obtain them at much lower prices than their predecessors did.

The so-called Zante currants are really grapes produced by vines which grow along the shores of the gulf of Corinth, a few other parts of Greece, and the islands of Zante and Cephalonia. The total annual crop has increased from 33,950 tons in 1859 to 127,300 tons in 1887. The United States takes 15,000 tons annually, the bulk of the crop going to Great Britain.

The exports of sugar from the Philippine Islands in 1889 were 220,000 tons, worth $11,000,000, of which 150,000 tons came to the United States. The other exports of agricultural products were: hemp, 568,571 bales, valued at $16,000,000 (219,907 bales to the United States); coffee, 6,000 tons, valued at $1,000,000; leaf tobacco, 9,000 tons; sapan wood, 5,000 tons; indigo, 554,500 pounds.

A very promising attempt to start the coffee industry in the Karen Hills, India, was defeated for the time by the ravages of rats. In two nights they nearly stripped all the fruit-bearing shoots from the trees of a flourishing plantation. They cut off the shoots and small branches, leaving the trees as if they had been severely pruned. The trees afterward recovered.

The question of actual cost to the farmer of raising a colt to four years was recently discussed in the Chamber of Agriculture, of Cleveland, England. One farmer put the cost at eighty pounds sterling ($400) from a mare kept idle for breeding purposes. From a general utility mare he estimated the cost at one-half the former figures. There was a general concurrence. It is not stated whether these estimates include the service fee.

Farming in Portugal, is according to the United States Minister, Dr. Geo. B. Loring, still carried on in a most primitive manner. All the reaping and mowing is done by hand, and the grain is trod out by oxen, as it lies full in the field. The king is said to be a sensible and level-headed man, and a good deal of a farmer, having raised last year thirty thousand hogs.

Raising potatoes under glass is an important industry in the Island of Jersey. No fire heat is required to grow potatoes to perfection in winter. The same houses are used for growing grapes and tomatoes, and after these crops have been harvested the potatoes are raised. One grower has four acres under glass, and finds the crop an exceedingly profitable one.

A bill has been introduced into the British House of Commons "to regulate the sale of foreign and colonial meats." It provides that it shall not be lawful for any person to sell foreign or colonial meat unless a conspicuous notice is placed over the shop indicating that foreign or colonial meat is sold there. This, if it becomes a law, will apply to Canadian beef and New Zealand mutton, as well as to American meats.

The edible Stachys, the new Japanese vegetable, which has been so extensively advertised does not seem to find much favor in France, from which country it was first distributed. As the introducer himself states its great merit consists in having no flavor whatever, and, consequently, it would take any that might be given it. It seems strange that Japan, which has given us such a large number of beautiful flowering plants, should have added so little to the list of desirable vegetables.

New Zealand has produced $240,000,000 worth of gold since 1851. In 1888 it exported 83,250,000 pounds of wool, which was five million pounds less than the export of 1887. But the purchase by local mills increased during the year by two million pounds. The exports of New Zealand flax (*Phormium tenax*) amounted to $376,345, being more than three times as much as those of the previous year. Of frozen mutton the exports in 1888 were 552,298 cwt., worth $3,140,000, an increase of thirty-seven per cent on those of the previous year.

The German peat-moss, which has hitherto been employed only for stable bedding is now quite extensively used in England as litter for poultry- and pigeon-houses. Its remarkable powers of absorption, cleanliness, and convenience, adapt it admirably to the purpose. Those who have used it report that while the peat-moss is in use the houses are dry, odorless, and free from vermin. It has to be changed only once a fortnight. The German moss has been introduced into the United States and is sold in bales for stable bedding.

This is the way the most delicate perfumes are obtained in France: Pieces of glass, about one-fourth of an inch in thickness, are covered completely over with fat. Then the flower petals are strewn over the glasses, which are then tightly cased in wooden frames. In a short time the perfume is all absorbed into the fat. The fat is now cut up into small pieces and put into alcohol, when the perfume separates from the fat and unites with the alcohol. The fatty particles are then removed, and the mixture is ready for the market.

Twenty-five separate agricultural institutions in Great Britain receive government aid for the purpose of assisting in providing general agricultural teaching, special practical instruction in dairy work, lectures on forestry, and the carrying on of agricultural experiments. Scotland alone receives for this purpose an annual government grant of nearly $9000, distributed among eleven institutions, of which the University of Edinburg receives the largest appropriation, of $2500. This looks picayunish to Americans, for most of our States give more for such purposes.

The government of Belgium has instituted a system of instruction in agriculture and forestry in the army. It is intended to reach only such soldiers as are the sons of farmers and who expect to return to the farm at the expiration of their respective terms of enlistment. The scheme embraces the purchase of land near the principal garrison towns for experimental and practical purposes. Here the labors of the soldiers are expected to not only familiarize them with farming, but also to produce crops, and thus assist to bear the burdens of the army.

The resources of Brazil are attracting much attention since her republican form of government was inaugurated. With 15,000,000 of people, she has an area of 3,000,000 square miles, much of it very fertile. Cattle-growing is not largely practiced, and the dairy business is quite unknown, although there is no doubt that it would pay immensely, Valuable mines of gold, silver, and copper are attracting attention, and among the valuable woods are rosewood and mahogany. Rubber trees form a large source of revenue to the country, while its immense coffee trade is well known.

The case instituted to test the legality, or otherwise, of dishorning adult cattle in Ireland has been dismissed. The case lasted three days, and in dismissing the summons the magistrate said: "We are satisfied on the evidence that the dishorning of cattle increases their market value, renders them more salable, is customary, and if suppressed would inflict very large pecuniary loss on the community. . . . There does not appear to be any other practicable method, causing less pain, by which the same objects sought to be attained can be carried out, provided that it be skillfully performed. . . . The advantages attainable by the operation of dishorning are out of proportion to the pain suffered by the animal."

The preparation of the Kombe poison is one of the important industries of Central Africa. The poison is contained in the seeds of *Strophanthus Kombe*, a strong, climbing plant which is always found in the vicinity of high trees, on which it supports itself. The native method of preparing the poison is very simple. The seeds are first cleaned of their hairy appendages, and then pounded in a mortar until they are reduced to a pulp; a little water is then added, and a gummy substance obtained from the bark of a tree which helps to keep the poison on the arrow. Game wounded by arrows thus poisoned die quickly. The flesh is said to be eaten without any injurious effects. The seeds form an article of export.

A deputation from the Association of Chambers of Agriculture recently waited on Mr. Chaplin, the British Minister of Agriculture, to urge the desirability of establishing a national school of forestry. One of the speakers pointed out that England stood alone among the nations of Europe in having no national school of forestry. He was informed that twenty-seven million acres of land in this country were out of cultivation which were eminently adapted for the growth of white and red fir, so much demanded for commercial purposes. Mr. Chaplin, in reply, said that there could be no doubt about the growing interest and importance of the subject which had been brought under his notice. The powers the Board of Agriculture possessed under the Act by which it was created were, however, limited to inspecting, aiding, and assisting schools, and it would not be in its powers, so far as he read the Act, to establish a national school of forestry such as that which the deputation had asked him to consider. He expressed a desire to have further information as to the twenty-seven million acres of land out of cultivation which it was said might be profitably planted.

OUR BASKET.

Ixias, Sparaxis, Tritonias.—Mrs. L. H. S., Conn.: After flowering, these plants should have all the light possible and a warm temperature, to ripen their bulbs. When the leaves begin to flag, gradually withhold water until the plants die down, then set the pots away where they will keep dry until the following winter, when the bulbs should be taken out and repotted. The offsets should be grown on in the same manner as the large bulbs, and they will flower the second year. *Lilium Harrisii*, if grown in a pot, should be treated in the same way, only, as soon as the weather will permit, turn it out into the border, without disturbing the roots, and it will flower again in the following autumn. If desirable, it can be made to bloom again, or several times in succession, by shifting into a pot one size larger soon after flowering. This lily requires but little rest, and, in shifting, the ball should be disturbed as little as possible. When in active growth, use liquid manure freely.

Prolific Hens.—H. C. Hopkins, Napa Co., Cal., writes us: "From June 1st, 1889, to June 1st, 1890, my one hundred and fifty S. C. Brown Leghorns have laid 22,632 eggs. Who can get away with this?"

Southern Plants.—J. Egan, Salem Co., N. J.: Because a plant is found indigenous to the Southern States, we are not to conclude that it will prove tender in the Northern. It is probably true that the majority of the plants indigenous to the Gulf States would not withstand the climate of New Jersey, and those on the same line to the westward, but experience has shown that a large number of kinds found wild in the South do thrive in the North. The Southern cypress from the swamps of Louisiana and Florida succeeds admirably in New Jersey and in the vicinity of this city. The oak-leaved hydrangea, which is one of our most showy summer flowering shrubs, is a native of the swamps of Florida and adjoining States. In fact, we could readily make up a long list of trees, shrubs, and herbaceous plants, all from the South, that are now common in Northern gardens.

Cleaning Solution.—Miss D. R. P., Newark, Ohio: Tailors and renovators of worn clothes are not usually free with what they call the secrets of their trade, and this is probably why the one of whom you inquired said that he "did not know what the renovators or cleaners of clothes used to remove the spots." A solution used by English tailors is made as follows: Take of ammonia two ounces, soap one ounce, soft water one quart, and a teaspoonful of saltpeter; shake well and let the mixture stand for a few days, or until the soap is thoroughly dissolved. Pour enough of this solution on a coat or other garment to cover the grease spot; rub well, and wash off with clean cold water. A quart bottle of this solution will not cost five cents, and is always ready for use when wanted.

Blight in Fruit Trees.—Mr. William M. G., Jefferson Co., Neb., has suffered greatly from "blight" upon his fruit trees, and desires information, and, if possible, a remedy for the serious trouble. Blight is a very general term applied to any form of unhealthy condition of twigs and foliage not assigned to preying insects, drought, or lack of food supply. These blights are usually caused by a low organism of the same order of obscure plants to which the toad-stools, bread molds, grape mildew, wheat rust, and corn smut belong. Nearly every kind of cultivated fruit has one or more of these blights either upon the foliage or fruit, or both. Mr. G. mentions the blight of the apple tree in particular, and upon this kind of tree there are several kinds of blight. There is a so-called "fire blight," that develops very rapidly in the tips of the young branches, causing them, with the foliage, to turn brown in midsummer as if scorched by great heat. This blight, it is generally conceded, is caused by a minute organism that effects an entrance into the tender tissues of the opening buds, and spreads down the twig. Another form develops upon the leaves in spots, which soon become brown, as if the foliage had been sprinkled with an acid. The name "leaf spot" is often given to this. Perhaps the worst blight is most generally known as the "scab." This forms in irregular, dark brown patches upon the leaves, but is most conspicuous and destructive upon the fruit. It may appear when the fruit is not larger than marbles, forming dark brown patches, and causing the affected parts to stop growing, when the scabby fruit becomes irregular, unsightly, and almost worthless. As to remedies, it may be said at the outset that the habits of the blight are yet quite obscure. There is very little to do for the fire blight except to remove the killed parts and burn them to check the spreading of the trouble. For the scab, there have been some fairly satisfactory experiments carried out, the details of which have been stated in the reports of the bulletins of the experiment stations as given in this and previous numbers of the AMERICAN AGRICULTURIST.

Forsythias.—Old Florist, Orange, N. J.: The gardeners and florists of England appear to have made up their minds that the pendulous or slender branched *Forsythia*, known in some catalogues as *F. Fortunei*, and in others as *F. suspensa*, is really a distinct species, and are determined to stick to their opinion in spite of all evidence to the contrary. We have read the article in *The Garden* to which you call our attention, and see that the author ignores all facts developed on this side of the big pond in regard to the species and varieties of these Chinese shrubs. If *F. Fortunei* were, as claimed, a distict species from the upright growing or *F. viridissima* it would come true or nearly so from seed, but, out of many hundred that we have raised from seed gathered from an isolated plant of the first, not more than one in every ten assumed the form of the parent, but nine-tenths reverted to the original or *F. viridissima*. Hence, we hold that this is the species and the other only a garden variety. The Forsythias seed so freely in this country that we have no difficulty in proving what we claim to be true.

Mildew on Chrysanthemums.—Gardener, Philadelphia, Pa.: Where chrysanthemums are grown closely together in pots or frames, they are very likely to be attacked by mildew—especially during rainy and cloudy weather. Sulphur is perhaps the oldest remedy, but to dust it over the plants gives them a rather unsightly appearance, and florists avoid using it if possible. English florists, who have far more trouble with mildew on chrysanthemums than those of this country, recommend sulphide of potassium, using one-half ounce of the sulphide to one gallon of water. If all parts of the plants are well wet with the solution, the mildew will be destroyed, and entirely disappear within twenty-four hours. We have tried this solution with excellent results, but must say that its odor is rather offensive, although it soon passes off. A weak solution of sulphate of copper, or one pound of the sulphate dissolved in a barrel (thirty gallons) of water has been recommended for mildew on greenhouse plants, and we are inclined to think it may be effective, while less offensive than the potassium sulphide.

Insects and Colors.—Miss S. T. Dixon, Illinois: Some, if not all, kinds of insects recognize color in flowers; for we can scarcely believe that the odor and taste of two varieties of the same species should be so widely different as to cause one to attract a certain species of insect, and the other repel it. For instance, as we are writing there is a large number of varieties of the Japan Iris blooming in our grounds, and, while the rose beetles swarm on the white flowers, they have not touched the dark-colored ones. We also notice that these beetles will devour the white roses first, then pass to the pink and deeper reds. In the Spiræas it is the same; the beetles swarm on the white, but never touch the pink and red blooming at the same time. We take advantage of this preference of the beetles for certain plants and colors, and plant numbers of the white spiræas blooming at the same time as the grapes, and, as the rose beetles seem to prefer the spiræa flowers, we have them where they do no special harm and, at the same time, can be conveniently shaken into a pan of hot water and killed. Having followed this plan of protecting our grapes for more than twenty years with never a failure, we conclude it is a good one and worth trying elsewhere.

Killing a Steer.—I. B. Ross, Herkimer Co., N. Y., asks how best to kill a steer. There are many ways, but the one recommended by veterinarians is by means of the bullet, or a sharp instrument which pierces the brain. Simply cutting the throat is objectionable and far from humane. In the large slaughter-houses a *spud* is employed. The sharp instrument is thrust into the base of the brain, the operator standing upon a framework above the victims. As it is not easy to locate the vital point to be reached it is probably best for the person not accustomed to the task to strike the steer a hard blow upon the forehead with a heavy ax or maul. In this way the brain is deranged. The place to be struck is at the intersection of lines drawn from the base of the horn to the opposite eye. In the case of the horse the base of the ear takes the place of the horn in locating the central point. The head of the victim should be fastened that the blow may be final and painless.

The Age of Plants.—R. L. Terry, Essex Co., N. J.: Plants are first divided into trees, shrubs, and herbs. The age of trees is best told by the rings upon the stump, there being one for each season. Hollow trees can be closely estimated by getting the average thickness of a ring. Shrubs can be aged in the same way. Herbs are divided into three groups: the annuals or all that sprout, grow, seed, and die in one year—biennials, or those requiring two years, as carrots, beets, turnips, and lastly, the perennials which live on indefinitely.

Black Rot in Sweet Potatoes.—Henry Hoffmeyer, Cumberland Co. N. J.: The trouble is caused by a low form of fungus that grows in the roots and turns the affected parts brown. The fungus may be found upon the lower parts of your plants as they are taken from the propagating beds. The diseased plants will have the lower portions of a dark color which may be only in small patches, or extend for an inch or more from the potato. The disease comes from the "seed root" and, therefore, the greatest possible care should be exercised in selecting the most healthy roots. Any tuber with the smallest patch of brown upon it should be discarded as worthless for purposes of propagation. After the plants are set the black rot may make its appearance and then they should be removed. A wet season seems to favor the growth of this decay but not so much as it does the soft rot which is worse at or shortly after harvesting. There is a soil rot that contaminates the land, and by continuous cropping may become so infested that it is wise to withold sweet potatoes for a time. The cause of this ground or field rot is not well known but is probably another fungus, that is, a low form of vegetation not very unlike the mildews, rusts, smuts, and blights of grain and fruits.

How to Build an Ice-House.—W. Bell, Cayuga Co., N. Y., asks a question that to some may seem out of season. No one thinks more of the importance of an ice-house than in the heat of midsummer. Ice during some weeks makes all the difference between appetizing meals and those that are far from tempting, and especially to those who are invalids. Therefore, now is the time to lay plans if not the timbers for an ice-house. One of the chief points to consider is, location with special reference to good drainage. A side hill is preferable, and it is always best to lay a tile drain around the building, three feet or so from the walls. The best filling is tan bark or saw dust and for these a six-inch wall is sufficient, the material being put in as the boards are added, beginning at the bottom. Ventilation must be provided for by openings at the gables or extending as a chimney through the roof. Cut the blocks of ice evenly, pack closely, and cover upon sides and top with six inches of saw dust. When straw is used the covering must be thicker.

Grape-rot.—Miss Denison Craig, Broome Co., N. Y.: Your grapes are attacked by a fungus known as black-rot (*Physalospora*) and this is the cause of withering and dropping off when only about half grown. This disease has been more or less injurious to grapes in our Western States for the past half century, but in recent years it appears to be rapidly spreading in the Eastern. There are many localities where the grape flourished ten years ago and

in which its cultivation is now abandoned, or a few raised under great difficulties. The vines as you say appear perfectly healthy and vigorous, the disease or fungus only attacking the fruit. Dusting the vines with sulphur soon after the fruit is set, or syringing with solutions of copper sulphate will often check the further advance of the disease, but we fear it is now too late in the season for the application of any of these remedies. Next year you might try to save your crop, and in the meantime we will endeavor to give full direction for preparing the copper sulphate and other solutions used.

Amoor Yellow-Wood.—C. Raymond, Ulster Co., N. Y.: The Asiatic species of the yellow-wood *Cladrastis Amurensis* is only a large shrub, growing six to eight feet high, while our native species, *C. tinctaria*, grows to a large size, and is one of our most beautiful ornamental trees. The flowers of the Amoor species are produced in a rather compact raceme, and are small and of a dull greenish yellow color, and not handsome. This shrub is valued because of its near relationship to our native yellow-wood tree, there being only these two species known. As the Asiatic species blooms and seeds freely in this country, it will no doubt soon be plentiful and cheap.

Canning Fruits, Etc.—S. D. M., Long Branch, N. J.: While the preserving of fruits, vegetables, milk, etc., in tin cans has probably become a more extended and highly perfected industry in America than in any other country, still the use of hermetically sealed cans is not an American invention, as has often been claimed. To M. Appert, of France, is due the credit of discovering that all such ordinary perishable articles as named can be preserved by excluding atmospheric air and germs of ferment which are always present. M. Appert's discoveries were perfected, and the right of use sold to the French Government for twelve thousand francs in 1810. The recipes for preserving a great variety of alimentary substances were soon after published in France, England, and this city, the first American edition appearing in 1812.

Oak-Pruner.—Subscriber, Mahwah, N. J.: The insect that you find cutting off the branches and twigs of your oak-trees is known by the common name of oak-pruner (*Elaphidion parallelum*). Some seasons it is so abundant that the forests and all groves are badly littered with the severed branches. The perfect insect is a slender grayish beetle nearly an inch long, the females depositing their eggs on the branches of large trees early in spring, and the young grubs bore through the bark and wood, feeding upon the pith until midsummer or later, then begin their pruning operations by cutting out narrow annular rings of wood from the center toward the outside until the branch is completely severed and drops to the ground with the grub within, for it is by this means that it makes its descent to the earth in safety. The grubs remain in these fallen twigs feeding upon the pith and wood until the following spring, then change into beetles. By gathering the twigs and burning them, we may in a measure check the increase of this pest.

The Jigger.—M. F. P., Burlington, Iowa: We did not suppose the jigger or sand-flea of the tropics were ever troublesome as far north as Iowa, and now think that you have made a mistake in the name and mean the common flea (*Pulex irritans*). The sand-flea (*Sarcopsylla penetrans*) lives on dogs and mice, and these animals carry them into houses, but they live mainly in sandy soils, and the females in summer will attack people and bore into the flesh of the feet and hands, causing distressing sores. We would advise you to sprinkle the walks and grass about the house with weak tar-water, soap-suds or a solution made of one part of carbolic acid to two hundred parts of water. Lime water might also answer, and not prove injurious to the grass.

Sanfain.—M. Reed, Rockland Co., N. Y.: Sanfain or Saintfain (*Onobrychis sativa*) is a forage plant much cultivated in some countries of Europe, where it is said to thrive on the poor chalk soils, and it is valued not only for hay, but for pasture. Sanfain is closely related to the vetches and alfalfa. The roots are perennial and penetrate the soil to a great depth, consequently are able to resist long droughts. We have cultivated it for several years, but do not value it highly, for the reason that we have so many more valuable forage plants which thrive in this part of the country. Alfalfa, or California clover, as it is sometimes called, is a far more vigorous growing plant, and we think preferable, even on the dry soils of the Western prairies, where red clover and some of the better kinds of grasses fail. Sanfain starts very early in spring, and the seed this year was fully ripe by the 1st of July.

Raising Heifers.—Philip Slater, Wayne Co., Mich., has a herd of Holsteins that cost him a good deal of money, and the heifer calves are the only ones he can sell; but for two years about two-thirds of the calves are of the male sex, and these he can not afford to fatten for veal, as the milk sells for more than the veal will bring. Therefore he desires to know how to breed only heifer calves. Nature has wisely regulated the relative production of the sexes, and though there are many theories put forward by wiseacres, yet, it is doubtful whether their observance will prove satisfactory.

Sweet Peas.—Nellie, Bridgeport, Ct.: If you want to make a grand success with sweet peas sow in rows and in soil made as rich as possible. Sow very early in the spring, and set brush four or five feet high along the row just as soon as the seed is in the ground. Cultivate and keep free from weeds, and when the flowers appear cut them as often as every other day to prevent the formation of seed if you want to keep the plants a long time in bloom. We do not know of any flowering plant that will give a better return for the cost of seed and cultivation than the sweet pea.

Maples Dying.—James E. Pratt, Washington Co., N. Y.: The filling up of the lawn eighteen inches to two feet over the roots of the maple trees is no doubt the cause of the trees dying at this season. Opening holes at different points over the roots and filling in with stones as you suggest might prove beneficial, but we fear that it is now too late to save the trees. Some kinds of trees, like the poplars and willows, will throw out new roots above the old ones when planted deep on soil heaped up above them, but the sugar maple rarely throws out surface roots, especially when they have reached the age of a dozen years.

Deformed Growth.—W. J. Steele, Allegheny Co., Pa.: The peculiar deformed second growth of the maple twig you send we can not account for, unless it has been caused by the destruction of the terminal buds on the twigs by some fungus or insect. We can not discover any signs of insect work in the twig, but the new growth is certainly abnormal or we might say dropsical, as it seems to be gorged with sap which has had the effect of greatly multiplying the number of leaves, none having sufficient room for full development.

Yellow Water-Lily.—F. Saxton, Rockland Co., N. Y.: The loss of your yellow water-lily (*Nelumbium luteum*) may not be due to cold and freezing of the water in the pond, but to muskrats, for this rodent is very fond of the tubers of this species of water-lily and will soon clear them out if given an opportunity. We once lost several thousand plants of this lily before we suspected the cause, or discovered the muskrats in our pond. They do not seem to trouble the more common water-lily (*Nymphæa odorata*), but they are very fond of the tubers of the larger and more rare species.

Amber.—Miss D. S., Chicago, Ill.: Amber is a fossilized resin, and not gum. It is now supposed that the source of this resin was forests of coniferous trees like the pines and firs, these having been submerged ages ago, the wood in great part decayed, leaving the resin to become hardened or fossilized. The most extensive amber mines in the world to-day are along the Baltic on the Prussian coast, but it is found in many other localities and as far north as Siberia and Greenland, and in several places in this country, but not in large pieces or quantities.

Removing Paint.—Apprentice, Salem, Mass.: Your fears of fire when removing old paint from the sides of houses and other wood work by burning off with alcohol or kerosene are well founded, and no painter who has thoroughly learned his trade would ever employ such means, because there are cheaper and more simple ways of killing old paint. If the oil in the paint is converted into soap it can be readily washed off, and this is just what we aim to do in such operations. To remove old paint from wood work use a solution of equa parts soda and quicklime. First dissolve the soda in water, then add the freshly slaked lime, stir well together and apply with an old paint brush. In a few minutes the paint will break and become brittle, and then wash off with hot water leaving the boards clean as when new. To effectually kill the alkaline solution, wash the clean wood with vinegar or other kinds of acid, even old hard cider will answer.

Green Scum on Tanks.—Julius C. A. Gross, Grundy Co., Ill.: The green "scum" which mantles stagnant water is a vegetable growth of one or another form. There is an immense variety of aquatic vegetation, ranging from micrococcus, one of the lowest forms of vegetable life, to Lemna and other flowering plants. There is nothing unhealthful in the green growth, but it may indicate a very unwholesome condition of the water upon which it appears.

Club-Foot in Cabbages.—J. Romer, Bergen Co., N. J.: The "knots or lumps" on the roots of your cabbages are caused by a diseased condition, commonly called "club-foot" by gardeners and *Plasmidiophora brassicæ* by men of science. The use of hen manure and even of stable manure are supposed to promote the evil. Burn every affected plant, and do not set cabbages again on the same soil.

New York's Semi-Centennial State Fair.—Secretary J. S. Woodward writes us that the magnificent new buildings on the fair grounds at Syracuse will surely be ready in time for the fair, September 11th to 18th. From present indications it promises to be the grandest and cleanest fair ever held in the Empire State.

Strawberries in Ohio.—E. W. Reid, Belmont Co., O., writes us that the most meritorious new varieties of strawberries he has fruited this year are: Warfield No. 2, Haverland, Bubach No. 5, Gandy, Pearl, and Stayman No. 1.

American Forestry.—The summer meeting of the American Forestry Association will be held at Quebec, Canada, in the Parliament building, from the 2d to the 5th of September. A highly interesting programme has been prepared, and every facility for studying the Canadian forestry system will be offered by the Provincial government. Information about membership and special arrangements for visitors may be obtained from the secretary, Dr. H. M. Fisher, 919 Walnut street, Philadelphia, Pa.

Grand Poultry Show in New York City.—Secretary T. Farrer Rockham, East Orange, N. J., informs us that the date for the next show of the New York Poultry and Pigeon Association has been fixed for February 4th to 10th, 1891. It has been decided that the judging shall be done by comparison, as by this method the judging can be got through with, and the prizes awarded, much more quickly than by the former method of scoring.

Western Massachusetts Poultry Association. At the recent meeting of this association Col. R. J. Hamilton, Springfield, Mass., was elected president, and S. W. Craig secretary. The next show will be held in the City Hall, Springfield, Mass., from December 17th to 20th. The biggest show ever held in the State is expected.

Keep the Stables Clean.—In hot weather especially, the stables should be kept scrupulously clean. The ammonia arising from the urine is offensive and deleterious. Ground plaster sprinkled over the stable floors converts the ammoniacal urine into an inodorous compound that helps to make the farm fertile.

Common Sense in Breeding and Feeding.—In every vocation of life, common sense is the safest and most reliable expedient. If we starve our acres, our animals, or ourselves, starvation will inevitably come to all. Our acres will yield no product without being fed, and this is equally true of our animals and of ourselves. Labor and thought are products that require ample nourishment and constant care to be remunerative. Common sense has taught the breeder and feeder how to make a cow give milk enough, and that milk rich enough, to make twenty-five pounds of butter in seven days.

AMERICAN AGRICULTURIST
FOUNDED IN 1842
SEPTEMBER, 1890.

A Grave Question.

The average public road or highway in the United States is a disgrace to modern civilization. Only in the vicinity of cities and large towns, and in a few other instances, do we have really good macadam roadways. In country districts and agricultural communities the condition of the highways can hardly be exaggerated. In our older States many important roads are little better than they were one hundred years ago, while in the newer West the absence of stone and the nature of the soil is some excuse for existing means of transportation.

A few years before the advent of railroads, a movement developed in favor of permanently-built turnpikes, which were constructed by private or public corporations and paid for by a levy of toll on those who used these fine roads. In Pennsylvania, New York, and elsewhere there are notable examples of such roads. But this spirit of highway improvement was nipped in the bud by the rapid development of the railroad. The more rails were laid for steam communication, the less attention was devoted to making durable roads. To-day we are dependent to an unfair degree upon the railroad. Its charges are so high for small lots of freight short distances that the farmer often finds it unprofitable to diversify his crops and cater to his local market, as the highway is usually in such condition as to preclude hauling a load of produce of profitable proportions any great distance. The rapid growth of villages and suburban communities at the apparent expense of the country may also find one of its causes in the better roads which so generally accompany the progress of thickly-settled communities.

Public attention has been directed to this state of affairs of late, and an agitation in favor of better country roads has already begun. Investigation reveals a sorry state of conflicting provisions in the various States for laying out, building, and maintaining roads. Some of the plans proposed in the way of reform and improvement are so cumbersome as to invite popular condemnation. They smack too much of additional offices and their expense without corresponding benefit. Aside from conflicting statutes and proposals for road administration, there is an even worse chaos of ideas about the practical work of road building among those who have it to do. While both the administration and the building of roads are important, the latter stands first.

The AMERICAN AGRICULTURIST therefore invites those who have had actual experience in building good roads to contribute the same to this magazine. Let our readers see just how good roads have been built under varying circumstances, what they cost and the expense of repairs. Then others can profit by such experience in the road work they have to do. A practical step will then have been taken which, insuring against costly errors in construction, will vastly stimulate public opinion in behalf of comprehensive means of highway improvement. Then it will be easier to elucidate a practical method of management and secure the legislation necessary to put it into effect.

Better roads must begin at home. The towns must build a sample road to show what such a highway should be. The sample need not be long nor expensive to be an object lesson that will educate up to great results. Self-help of this kind will give a real impetus that never can be created by some grand and more or less visionary scheme of highway betterment. A small demonstrated success is worth thousands of theories in works of this kind. The comparatively few individuals who have had practical and successful experience in road building should therefore be prompt to reply to this invitation of the AMERICAN AGRICULTURIST.

The Bright Side of Farming.

Those who are fond of looking upon the dark side of American agriculture, and who are inclined to be pessimistic regarding its future, will not find much comfort in certain facts presented in the last annual Report of the Department of Agriculture. These facts are three in number, and each one should be strongly impressed upon every farmer in the United States, for what man has done man can do again.

The first is that since 1850 the average weight of the fleeces produced by our sheep has doubled. Probably the sheep have been better cared for, possibly better fed than formerly, but the one great factor in the gain has lain in the improvement of our stock.

The second fact is that while the number of milch cows in proportion to our population has decreased fifteen per cent within the same time, the product has maintained its ratio to population. That is, 235 cows to each 1,000 of our population are keeping us as well supplied with milk, cheese and butter as 275 cows did formerly. Improved methods of feeding, especially of winter feeding, and the judicious use of our corn crop for that purpose has had much to do with thus increasing the average product of the individual cow, but as before the fundamental cause is in the fact that we use better stock in the dairy than formerly.

The third fact is that while the number of beef cattle in proportion to our population is now steadily diminishing there is no apparent decrease in our meat supply. This is almost wholly due to the improvement of stock. By abandoning the scrub we have obtained cattle that mature earlier, weigh more and dress heavier than formerly, so that a less number of head will furnish a greater food supply.

There is no reason to believe that we have reached the limit in any of these matters; the same determination to improve our stock, which has been so manifest during the past generation and which has accomplished so much, may lead to still greater results during the next generation. It is to be regretted that the products of our acres have not been subject to like conditions. But there are indications that our apathy in that respect is about at an end. The agricultural press, seconded by the colleges and experiment stations, have been sturdily engaged in awakening our farmers to the fact that the product per cultivated area is not what it should be; and when this fact is fully realized they will go to work to improve this condition in the same way that they have already improved the condition and value of live-stock and product thereof.

An Autumn Vacation.

As a class, farmers allow themselves too little recreation. They are so accustomed to working right along from one year's end to another that it becomes more and more difficult to get out of the rut, and some almost seem to think that if they were not at home every day in the year the farm might run away.

The farmer, and the farmer's wife should have an outing at least once a year; then they should throw aside all care, arrange with a neighbor to look after the stock, and go away for the sole purpose of enjoying themselves. The time for this can usually best be taken in the autumn, somewhere between harvest and cold weather. When the woods begin to turn, and when the days are neither too warm nor too cool for out-of-door enjoyment, is the ideal time for the farmer's jaunt. It is not necessary to go far away from home, nor to great expense in preparation. Thoreau has said that a township six miles square would suffice a man in which to travel for a lifetime. He meant that one could always find something new within that area; always even within so small a space be learning something new about the world we live in. The farmer might use his own conveyance, and if the vacation is to last ten days he would better go no further from home than can be comfortably driven in three.

The start may be made for some definite objective point where friends or relatives are to be visited, or the horses' heads may be turned away from home, and let go whereever the best roads lead. This has the charm of novelty, and we shall thus come continually upon the unexpected. At noon, or night, the door of many a hospitable farm-house will swing wide open, and farmers will gladly welcome brother farmers to their homes; new and pleasant acquaintances will be formed; there will be opportunity for exchange of ideas regarding crops and stock. Wives will counsel together about jams and jellies, and the fashions, a subject dear to the feminine heart, whether in town or country. If pleasant friends are found, and mutual benefit is likely to arise from a fuller acquaintance; if it is desired to examine the stock, or to find out what that particular farmer is most successful in, and how he is successful, there may be as much pleasure and profit in stopping over a day as in "getting on" thirty miles further.

A week, ten days, or a fortnight, spent in thus rambling about one's own and adjoining counties will furnish pleasant recollections with which to beguile the coming hours of winter, and doubtless furnish some new ideas which you can put into practice in the spring. Those who have once tried such a vacation will look eagerly forward to its repetition the next season, and will consider the time and money invested well spent.

"Good gracious! where can I get a blanket to fit that horse?"

You can get large size 5/A Horse Blankets if you will ask for them. 5/A Horse Blankets are the strongest, and are made in all qualities, at prices to suit everybody. There are thirty different styles between two dollars and five dollars each.

Beware of imitations which are represented to be just as good as 5/A Horse Blankets, but which will not wear. Always look for the 5/A Trade-Mark sewed inside.

5/A HORSE BLANKETS are made by Wm. Ayres & Sons, Philadelphia, and are for sale by all dealers. If you can not get them from your dealer write them. There are **Thirty Styles** at prices to suit all. Among them are the **5/A Five Mile,** with five miles of warp threads in each blanket. **5/A Boss Stable,** a giant for strength. **5/A Electric** for out door use, very strong. **5/A Extra Test** which stands the highest test for strength. Also the celebrated **5/A Baker** which is used by railroad, express and fire companies in all the large cities. These are shown in the **5/A Book,** which you can get **free** from your dealer. Ask for it.

---

5 TON SCALES $60 Beam Box Tare Beam ALL SIZES Send for Terms.

JONES OF BINGHAMTON N. Y. HE PAYS THE FREIGHT

WALL PAPER

BARGAINS!

We will guarantee all these clean new goods just made, and full length—8 yards to the roll.

An 8-yd. roll White back Paper, 3 to 6c.
An 8-yd. roll Gilt Paper, 5 to 10c.
An 8-yd. roll Embossed Gilt Paper, 8 to 15c.
Gilt Borders, 4 to 18 inches wide, 2 and 3c per yd.
Borders without Gilt, 2 to 9 inches, 1c per yard.

Send 4c in stamps for samples of the best and greatest bargains in the country.

F. H. CADY,
305 HIGH STREET,
Mention this paper. Providence, R. I.

Established 1852 JACKSON BROTHERS,
New York State Drain-Tile and Pipe Works,
MAIN OFFICE, 88 Third Ave., ALBANY, N. Y.

ROUND, SOLE AND HORSE-SHOE TILE. Over 18 Inches Long. By Cargo or Smallest Quantity. Price List on Application. Prices that cannot be undersold. Our new improved Machinery makes a Superior Round Tile, excelling anything offered before and at greatly reduced prices. First premium wherever exhibited. Also, wholesale agents for the celebrated Akron Salt-Glazed Sewer-Pipe. Prices low for small or large orders.

GREAT FALLS, MONTANA. City of wonderful resources, immense water power, gold, silver, copper, lead, lumber, coal, iron, cattle, horses, wool and agriculture. Phenomina! growth. For full particulars address **SECRETARY BOARD OF TRADE, Great Falls, Montana.**

ALLCOCK'S

POROUS PLASTERS.

Senator JAMES F. PIERCE, of New York, writes:

"For the past two years I have suffered very much from an aggravated form of nervous dyspepsia. I have resorted to various remedial agents, deriving but little benefit. A few months since a friend of mine suggested the trial of ALLCOCK'S POROUS PLASTERS. Following the suggestion, I have been using the same with the happiest effects. To those similarly afflicted let me suggest the manner of their use. I place one over my stomach, one over the hepatic region, and one on my back. The effect was excellent, and from the day I commenced their use I have been slowly but surely improving, and I am quite confident that by their continuance, with careful regimen, I shall again be restored to my accustomed health."

Beware of imitations, and do not be deceived by misrepresentation. Ask for **ALLCOCK'S,** and let no solicitation or explanation induce you to accept a substitute.

FIRE PROOF. Easily applied by any one. Send for Samples and Descriptive Price List.

H. W. JOHNS MANUFACTURING COMPANY,
SOLE MANUFACTURERS OF
H. W. Johns' Asbestos Fire and Water Proof Sheathing, Building Felt, Steam Packings, Boiler Coverings, Liquid Paints, Roof Paints, Roof Cement, Fire Proof Paints, etc.
87 MAIDEN LANE, NEW YORK.

The **Maher & Grosh** goods are **hand-forged** from **razor steel,** as blades were made 100 years ago. Every one is tested and warranted. Their 80 page free illustrated list gives hints on using, choosing and sharpening **knives, razors, scissors,** etc., which are the result of a life-time's study. Take the knife shown here, exact size, made on honor, price **65c.** Sample for awhile sent post-paid, **48c;** clubs of **5** or more **40 cents** each post-paid. 7-inch steel shears **60 cents.** Knife and shears, **$1.** Fine three-blade pen-knife, **$1.** Best pruner, **85c;** cattle knife **$1.**

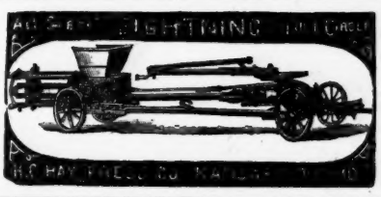
MAHER & GROSH,
4 S Street,
Toledo, Ohio.

HYNDMAN'S STEEL ROOFING

which has become so popular, is cheaper and more durable than TIN or SHINGLES. It is just what every farmer wants.
It is proof against Rain, Winds, Lightning, Snow and Fire.
You can put it on Yourself. $3.60 will buy 100 sq. ft.
The best in the world. For the latest information in regard to reliable and durable Roofing address W. G. HYNDMAN & CO., Cincinnati, Ohio. Mention name of paper when you write.

BUSH ROAD CART CO.,

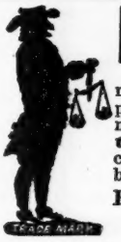
LANSING, MICHIGAN, Manfrs of
THE CELEBRATED PHAETON CART.
LIGHT SPEEDING AND
SKELETON CARTS AND ROAD WAGONS.
But one Grade made—THE BEST.
Write for Circular and prices.



THE SUPERIOR FERTILIZER GRAIN DRILL

The BEST in the WORLD

THE SUPERIOR DRILL CO.,
SPRINGFIELD, OHIO,
Manufacturers of **GRAIN DRILLS, CULTIVATORS, CIDER MILLS HAY CARRIERS and FORKS.**
☞ Farmers, see our local Agent, or write us for catalogue and prices.



LEWIS' 98% LYE

POWDERED AND PERFUMED.
(PATENTED.)

The *strongest* and *purest* Lye made. Will make the *best* perfumed Hard Soap in 20 minutes *without boiling.* **It is the best** for disinfecting sinks, closets, drains, washing bottles, barrels, paints, etc.

PENNA. SALT M'F'G CO.
Gen. Agts., Phila., Pa.

SEE MURRAY'S BIG REDUCTION SALE, PAGE 487.

ANIMAL AILMENTS.

Deformity.—W. B., Agassiz, B. C., has a young colt four months old born with deformity of the fet-lock joint. Hand-rubbing and time will do all that can be done for such a defect. The splint on the mare's leg is incurable. Do not breed defective animals. The best and most perfect do not produce too good progeny.

Constipation.—Mr. Thomas Jaffray, Dona Ana Co., N. Mex., has a Percheron colt that is constantly constipated, and wishes to know the cause and remedy. Probably the dry food consumed. Give bran mashes at night, green food during the day, and keep him from eating dried or sunburnt grasses. Lettuce once daily will be serviceable.

Doses of Poisons.—A. Pettler, Putnam Co., Fla., desires to know how much strychnine or arsenic a hog may eat without injury to itself. Extremely large doses, by acting as emetics or cathartics, seem to produce little injurious effect, while small doses are poisonous. Poisons are ticklish things to give to any of our domestic animals. One-half of a grain of arsenic and one-third of a grain of strychnine is a safe dose for swine.

Crust on a Cow's Back.—Mr. T. A. Conway, Polk Co., Fla., has a young cow that has a place on the middle of the back three inches wide and twelve to fifteen inches long that has no hair on it, and it is covered with a white crust which is not tender to the touch. Paint it every second day with tincture of iodine. It is also advisable to rub over it with the finger a teaspoonful of vaseline the day after the iodine is applied.

Corns.—Wherever the shoes of animals bear unevenly upon a part of the bottom of the foot, local inflammation, tenderness, and pain make locomotion constrained and painful. The shoe must be removed, the red part pared and a piece of old felt hat saturated in kerosene placed under the shoe. This can be frequently wetted by pouring kerosene on it even when the shoe is replaced. This will cure any corn of man or beast when the causing pressure is removed.

Plethora—Excess of Blood.—Samuel Q. Finch, Lincoln Co., So. Dak., has a fine young Angus bull that is dull and feverish nearly all the time. He is in good condition, quite fat, but his coat is rough and dull in color. The best of care is given him. He is well fed and cared for. The trouble is plethora, or excess of blood from too free feeding of too rich food. Gradually drop off your feeding. Give a pint of linseed oil in the morning followed by wheat-bran slops.

Strain.—James Proctor, Delta Co., Tex., has a valuable saddle horse that strained a hind leg in a sudden jump. He has used nearly every method he could learn of to relieve the horse, but has only partially succeeded. The time having long past, counter-irritants may be more successful. Use spirits of turpentine by smart hand-rubbing the swelled ankle every day. If not decidedly relieved, blister the leg several inches above, below, and all around the lame joint.

Lockjaw.—Herman Feltler, Suffolk Co., N. Y., has a young horse that has had lockjaw and came near dying last year. He is now nervous and suddenly starts without apparent cause. He is well fed on oats and hay, and driven only on Sundays. Give your horse less jaw exercise and more daily work on fewer oats and more wheat bran, and his nerves will become steady. A horse to be sound and healthy requires at least four hours of daily work. Lockjaw is prevalent on Long Island in all classes of animals, man included.

Husk—Parasitic Bronchitis.—In this as in any other infectious or communicable affection, sick animals should invariably be separated from each other, and especially from the well ones. Besides it is unpleasant and harmful to have sick animals annoyed by those which are well. They should be placed in a dry, warm stall, and have a tablespoonful of flowers of sulphur cautiously burned mixed with tar or kerosene to facilitate ignition, so that the fumes may cause the calf to cough up the offending worm. This may be repeated daily with a moderate degree of confinement lest the animal strangle to death, when the cure would be premature and unsatisfactory. A cast-iron vessel must always be used lest fire should occur. The sulphurous acid gas kills the worms. Syringing the calf's nostrils, with the head well raised, with ten drops of carbolic acid to half a pint of warm water daily, if gently performed will kill the worms, but if roughly done will possibly kill the calf.

Colic in a Horse.—Decatur Holbert, Wayne Co., Penn., has a valuable horse that is subject to flatulent colic every week or two. He should feed regularly, water often and sparingly and make no change in diet suddenly. The following prescription repeated every half hour until relief is secured: Spirit of turpentine, four ounces; linseed oil, twelve ounces; laudanum, one and one-half ounces. Mix. A large bottle of this mixture should be kept on hand for an emergency. Neglect may result in fatal obstruction or inflammation of the bowels.

Sunstroke.—The excessive heat of summer in pent-up cities where the pavement and buildings are heated to 110° to 120° F., and where the head of the horse is unprotected, destroys many horses. The horse stops suddenly, braces the feet, pants with drooping head, and if not soon relieved he falls to the ground and expires in convulsions. The preventive measures are best and most humane. A wet sponge, a hood over the top of the head, slow driving, frequent watering, with oatmeal stirred in the water, are reliable. Cold water poured upon the head, brisk rubbing the body, and cool shade will give relief.

Red Water.—Mr. A. Bush moved his herd of Jerseys to northern Alabama, from near Mobile, into Calhoun county. Though the location was a beautiful rolling valley in the mountains, with apparently every healthy surrounding—pure water, exhilarating air, good grass—yet within a week a valuable bull became sick, and notwithstanding everything was done for his relief, yet he died in great agony in four days. So from time to time thirty cases occurred, resulting in the death of three bulls and seven cows. The disease was carried with the cattle. It came from wet, undrained pasture and damp stables before being moved. The very fact of two-thirds of those attacked recovering shows the salutary effect of the locality to which they were changed. Probably all would have died if they had not been sent to a healthy place. Great debility from malarial poison produced the disease. The early administration of quinine is the only remedy that could be added.

Disease Germs.—M. Terry, Chester Co., Tenn., asks what is meant by "disease germs." The contagious diseases of domestic stock result from the spread of disease germs, or seeds of disease. We must sow in order to reap. It is equally the case in the production of a crop of contagious disease of any kind. In foot-and-mouth disease, hog-cholera, contagious pleuro-pneumonia, and other contagious diseases, there is a sown germ, a seed that when planted in natural soil will develop and grow and exhaust the soil it grows in, and result in the death of the animal that fosters it. The winds and the waters when impregnated with these minute disease seeds sow them in the direction of the currents of the air and of the water. The spread of the contagious fevers too is largely due to the improper practice of the golden rule. The mean selfishness that fosters contagious diseases of animals for fear of personal loss results in not only loss to one's self but loss to one's neighbor. Selfishness is a destructive element in uneducated human economy.

Barrenness.—Jeremiah Franklin, Fleming Co., Ky., has two young Shorthorn cows, three and four years old respectively, that do not breed. They are large and in good flesh and hearty. Put them into the yoke and give them daily work on grass. It is the special characteristic of the Shorthorns to fatten. No breed will take on flesh so fast as this. Many old Shorthorns of the blue grass regions require plenty of work to keep them breeding. The bulls of nearly all of the valuable breeds would be more potent for regular farm work. Luxurious ease is enervating to man and animals. The same complaint of barrenness of Berkshire sows, of expensive strains, comes from Mr. Peter Sileck, of McDowell, Barry Co., Mo.: These came from the finest Oneida Co., N. Y. stock. The stock is sound, healthy, and no fault can attach to it. The trouble is too close confinement and too high feeding. Give your sows the run of the orchard, and lighter feeding. Boiled potatoes and artichokes, with a little shelled corn. Bran slop once a day will reduce the fat. Fat sows of any breed are shy breeders.

Home Remedies.—It may be well to deal gently in the onset in the use of remedial agents, and as salt is used as a preservative for animal bodies after death it will be useful to learn something of the value of salt during the life of animals. Chloride of sodium, common salt, is a large constituent of mucus, and is, therefore, a partial food for all mucous membranes. These extend throughout every part of the body communicating with the external air—as the nose and lungs, the mouth and throughout the stomach and bowels, etc. This may account for the necessity of salt for most animals as a preservative of health, and as a safe remedy in many diseases. Salt in a dry state in man and animals is a remedy for both internal and external bleeding. In large doses, in solution in water, it is a prompt and safe emetic, completely emptying the stomach of its contents; and in smaller doses, given three or four times daily, it acts as a worm remedy and thorough physic. From some unknown peculiarity it is not a safe physic for the horse. The dose for the grown ox tribe is a pound dissolved in thin gruel; in sheep from one to three ounces. In small doses it is a digestive stimulant, and especially when combined with ginger. As an enema in constipation it is very effective in man and beast.

Diagnosis of Animals' Diseases.—Attitude, position, or movement often reveals the location and the true nature of disease in domestic animals. Spleen, make believe, and deceit, have no place in the honest expression of complaints of our sick animals. The fact of an active, well man, when sick taking to bed, when the lower limbs are uninjured, of itself, denotes more than ordinary illness. But when an animal whose limbs are uninjured lies down from sickness, it shows not only that it is sick, but even more seriously than even the honest expression of human sickness. Animals are not cursed with sentiment or duplicity. Then, under the above conditions, when a horse lies down for any considerable time, the case is, doubtless, more serious than with less spirited animals. The supine position of a sick person, especially when sunken down in bed, indicates great debility, exhaustion, or paralysis. This inference will hold good of an animal in its natural attitude—lying stretched at full length for a long time, will be one of the strong presumptive reasons why the diagnosis may be of a serious malady. Rheumatism of either man or beast would form the exception. This long-continued position of animals indicates some serious internal or external affection. It may be pleurisy, or inflammation of an important organ. Young animals in perfect health move quickly, firmly, and with marked exactness. When weak or suffering pain, the movements are reluctant, slow, stiff, and cautious. Men stagger from intemperate indulgence, but when an animal staggers there is brain trouble. When men drag their lower limbs along, it may be from laziness, but when animals drag the hind limbs it indicates paralysis. The general appearance, the expression of countenance, the condition—being fat or lean, sleek or rough, as well as attitude, are strongly expressive to the experienced observer of the state of health, or even of the kind of ailment present in the animal. It requires the closest observation to detect disease in an animal, for it both refuses to tell the truth or to lie by the word of mouth. If the human subject is a careful study when sick, the sick animal is a mystery dark and deep. Apathy and stupor are as full of meaning in a sick animal as in a sick man. The jaundiced eye has as great a significance in the one as in the other. A dusky flush on the face, with rapid respiration and hot skin, indicate in all subjects inflammation of the lungs. It requires the closest study of the animal physiognomy to locate the hidden canker. Puffiness of the eyelids in the animal may hint of Bright's disease; a bluish color of the visible membranes shows that the venous current of blood is somewhere interrupted, that aeration is defective; or a straw-colored hue creates a suspicion that there is a malignant disease preying upon the vitals; the thick upper lip and pale membranes hint of scrofula or consumption. If it requires the educated and experienced physician to learn human maladies, it requires as deep intellectual probing on the part of the veterinarian to evolve animal ailments.

OPEN TO CONVICTION

Read and Decide for Yourself.

"Dr. Haas' Hog Remedy is a certain preventive of Disease, making pigs thrive well and gain flesh fast."

J. H. WALTON, Birmingham, England, (Purveyor to H. M. the Queen, and H. R. H. the Prince of Wales.)

"Pigs fed with Haas' Remedy I consider cholera proof." JOHN HORTON, Unadilla, Neb.

"Would not be without it."
HENRY FOSTER, M. D., Prop. "Sanitarium," Clifton Springs, N. Y.

And hundreds of similar testimonials from well known Breeders and Feeders.

DR. JOS. HAAS'

HOG AND POULTRY REMEDY

USED SUCCESSFULLY 14 YEARS.

PREVENTS DISEASE, STOPS COUGH, INCREASES FLESH, | ARRESTS DISEASE, EXPELS WORMS, HASTENS MATURITY.

PRICES: 25 lb. cans, $12.50; $2.50, $1.25 and 50c. a package. Largest are cheapest.

Orders by mail receive prompt attention. Write for circular. Send 2 ct. stamp for "Hogology," a 64 page pamphlet on swine. Mention this paper. **JOS. HAAS, V.S., INDIANAPOLIS, IND**

CIDER MACHINERY

Knuckle Joint & Screw Presses, Graters, Elevators, Pumps, etc. Send for Catalogue

Boomer & Boschert Press Co. 216 W. Water St. Syracuse, N.Y

MUSIC

In all Departments. PIANO, ORGAN, VOICE, VIOLIN, &c.

Under best Teachers in class and private lessons. Tuition, $6 to $60 for 20 lessons; and many **Free Classes, Lectures, Concerts,** Recitals, Analyses, etc. *Elocution and Oratory, Fine Arts,* Literature, Languages, Piano and Organ Tuning. **BEAUTIFUL HOME** for Young Lady Students. Calendar free. Fall Term begins Sept. 11, '90.

NEW ENGLAND CONSERVATORY.
Franklin Square, Boston, Mass. E. TOURJEE, Director.

HORSE POWERS.

Latest Improvement

Machines for SAWING WOOD with Circular and Cross-Cut Drag Saws. Also, Machines for THRESHING and CLEANING Grain.

Acknowledged by all to be

THE BEST

considering

Easy Draft, Durability, Quantity and Quality of Work. 50-page pamphlet **Free.** Address

A. W. GRAY'S SONS, PATENTEES AND SOLE MANUFACTURERS, **MIDDLETOWN SPRINGS, VERMONT.**

Mention AMERICAN AGRICULTURIST.

ESTABLISHED JAN. 1st, 1866.
PATENT WATER PROOFED

CHEAP STRONG WATER PROOF, Applied by our new Patent method with ½ the labor of any other way. Unlike any other roof. **No rust or rattle.** An **Economical** and **DURABLE SUBSTITUTE** for **PLASTER** on walls. **Ornamental CARPETS** and **RUGS** of same material, **cheaper** and better than Oil Cloths. ☞ Catalogue and **Samples Free.**

W. H. FAY & CO. CAMDEN, N.J.

LYON & HEALY

STATE & MONROE STS., CHICAGO.

will mail, free, their newly enlarged Catalogue of Band Instruments, Uniforms and Equipments. 400 Fine Illustrations describing every article required by Bands or Drum Corps, including Repairing Materials, Trimmings, etc.

Contains Instructions for Amateur Bands, Exercises and Scales, Drum Major's Tactics, By-Laws, and a Selected List of Band Music.

☞ Monitor Incubator!

Send stamp for new circular.

A. F. Williams,
Bristol, Ct.

Mention AMERICAN AGRICULTURIST.

ARMS AND LEGS

WITH

RUBBER HANDS AND FEET.

NEW PATENTS AND IMPORTANT IMPROVEMENTS.

RUBBER HANDS AND FEET give the most natural appearance, secure the greatest durability, and are vastly more comfortable than the old styles with cumbersome machinery.

The engraving represents CEACA YAMNI, a Sioux Indian dressed in his war costume. The "brave" lost his leg from disease and has been supplied with one of MARKS' patent legs with rubber foot, which has so thoroughly restored him, that he mingles with his tribe and engages in their sports and labors with as much grace and energy as if he possessed his natural limbs.

Men, women and children of all ages and conditions, and residing in all parts of the world can be supplied with these peerless substitutes while they remain at home, and have every assurance that the results will be the best.

Nearly eleven thousand are now being worn, scattered throughout the world and give universal satisfaction.

U. S. Pensioners supplied on government order at no expense to themselves.

A treatise of 400 pages with over 200 illustrations and a thousand testimonials sent free to those interested; also a copyright formula by which limbs can be made and sent to all parts of the world with guaranteed success without requiring the presence of the wearer. ESTABLISHED 1863.

A. A. MARKS, 701 Broadway, New York.

ERTEL'S
VICTOR HAY & STRAW PRESS

Shipped anywhere to operate on trial against all others; purchasers to keep the one doing most and best work for least money. Thousands in use. Established 1867. Circulars free. Address Manufacturers, GEO. ERTEL & CO., Quincy, Ill., U.S.A., or London, Can.

OUT OF PAPER?

Mail Rates, 16 cents per pound, Express often cheaper.

ASK YOUR STATIONER FOR THE { BOSTON LINEN, BOSTON BOND, BUNKER HILL LINEN,

FINE PAPERS AND ENVELOPES.

☞ If he does not keep them, send us three two-cent stamps for samples of these and other writing papers, representing more than 250 Varieties which we sell BY THE POUND, from 15 cents upward.

SAMUEL WARD CO. (Incorporated), Stationers, Engravers and Printers, 49–51 Franklin St., formerly of 184 Devonshire St., Boston.

$10 will buy a **$15 CIDER AND WINE MILL,** and $12 an $18 mill. Circulars on application. **John W. Douglass,** 57 Beekman St., N. Y. City.

SEE MURRAY'S BIG REDUCTION SALE, PAGE 487.

BEECHAM'S PILLS

PAINLESS. EFFECTUAL.

☞ WORTH A GUINEA A BOX. ☜

For **BILIOUS & NERVOUS DISORDERS** SUCH AS Sick Headache, Weak Stomach, Impaired Digestion, Constipation, Disordered Liver, etc.,

ACTING LIKE MAGIC on the vital organs, strengthening the muscular system, and arousing with the rosebud of health The Whole Physical Energy of the Human Frame.

Beecham's Pills, taken as directed, will quickly RESTORE FEMALES to complete health.

SOLD BY ALL DRUGGISTS.

Price, 25 cents per Box.

Prepared only by THOS. BEECHAM, St. Helens, Lancashire, England.

B. F. ALLEN CO., Sole Agents for United States, 365 & 367 Canal St., New York, who (if your druggist does not keep them) will mail Beecham's Pills on receipt of price—but inquire first. *(Mention this paper.)*

NOW READY!

Illustrated Catalogue OF THE **"KEYSTONE"**

CORN HUSKER AND FODDER CUTTER COMBINED.

This catalogue contains much of value and interest. Address

KEYSTONE MFG. CO., Sterling, Ill.

Mention this paper.

AGENTS WANTED **An Opportunity Seldom Offered.** To sell the most useful instrument ever invented. Salary or commission paid. A Present sent to all applicants who address (with stamp) **NATIONAL TYPE WRITER CO.,** Boston, Mass.

$75.00 to $250.00 A MONTH can be made working for us. Persons preferred who can furnish a horse and give their whole time to the business. Spare moments may be profitably employed also. A few vacancies in towns and cities. **B. F. JOHNSON & CO., 1009 Main St., Richmond, Va.**

MATTERS OF BUSINESS.

The Crop Outlook.

The Cotton Crop, according to the August cotton returns of the Department of Agriculture, shows a slight advance in condition in the Carolinas, Tennessee, Mississippi and Louisiana, a fall of one point in Georgia and Florida, of two in Alabama, four in Arkansas and seven in Texas. The general average is 89.5. It was 91.4 last month. Condition is therefore still relatively high. The improvement in the Mississippi river bottoms is from rapid growth of late plantings of submerged areas. A fair stand, vigorous growth and abundant fruiting is generally reported. There are frequent references to droughts, in some instances of several weeks duration, followed by sufficient rainfall, in some cases by excessive rains. Yet there has been no general drought, and local estimates indicate small reductions of condition. One section of a county is reported dry, while another is too wet. Storms appear to have been quite local over portions of the cotton belt. Sandy soils have been benefited by rains which have damaged bottoms and clay uplands, and the drought which has scarcely wilted the plants in heavy soils has injured the crop in light lands. There are frequent reports of superior promise, the best for several years, in one county in Georgia the best in thirty years. The only forms of injury reported are a tendency to drop leaves and fruit, after sudden changes from dry to wet weather, and an occasional attack of rust. The caterpillar is not very prevalent, and has done little damage. The boll worm is somewhat more formidable in the Southwest. The Department's averages of condition August 1 and its preliminary June estimate of acreage lead the AMERICAN AGRICULTURIST to the following comparison, which indicates a yield of close upon 7,000,000 bales.

States.	Condition August 1. 1890.	1889.	Acreage. 1890.	Bales of 450 lbs. 1890.
Virginia	93	63	41,503	9,951
North Carolina	96	80	1,091,973	275,959
South Carolina	95	90	1,694,218	557,397
Georgia	94	91	3,024,259	1,072,252
Florida	90	95	267,739	78,582
Alabama	93	90	2,302,969	1,082,961
Mississippi	90	88	2,649,128	990,773
Louisiana	89	92	1,036,862	397,991
Texas	82	91	4,379,358	1,476,448
Arkansas	85	93	1,407,875	624,596
Tennessee	93	78	881,473	188,185
Missouri.	85	85	79,016	25,987
Average and total	89 5	86	19,096,414	6,781,080
Crop of 1889				
" 1888			19,068,818	6,520,051
" 1887			19,058,591	6,306,150
" 1886			18,641,067	6,438,000

In Corn, a fall of twenty points indicates the disaster which has befallen the crop during July. Its condition August 1 is reported at 73.3, against 94.8. The cause is the abnormally high temperature of the central maize districts, with insufficiency of rainfall. The returns of drought, which cover a broad area, and the severity of effects produced, are more general and depressing than the signal-service record of temperature appears to indicate. One factor in the blighting of vegetation is evidently the hot winds that have scorched the lower basin of the Missouri valley and the Ohio valley. The change from drought to daily saturation by repeated and heavy showers has been too sudden and extreme in those regions where drought has been relieved by seasons of moisture. The crop is late in the New England States, and will require a long, warm season to mature it. In the Middle States the high temperature has advanced growth in the northern districts, and in the more southern there has been some injury from drought. The South Atlantic States report local droughts, with subsequent rains, and comparatively good though somewhat reduced condition of corn. Some counties in Mississippi have suffered materially from absence of seasonable moisture. In Louisiana the crop is in high condition, though somewhat late in the overflowed districts. In Texas the crop is now matured, and is good except in the area that has suffered most from drought. Late planted corn in Arkansas has been seriously injured by drought of the last three weeks in July. In the western and southwestern part of Kentucky the crop has been severely scorched, but the rains since July 23 have materially relieved the fields of the central and eastern districts. In Ohio there is a great difference between the northern and southern parts of the State. The southern division of the counties of Indiana and Illinois have likewise received greater damage than the northern. Condition is slightly higher in Missouri. In Kansas the severity of the drought has culminated. Iowa and Nebraska are nearly in the status of the Ohio valley, while Minnesota makes the highest average of all the States. Wisconsin suffers slightly and Michigan still more from drought. With such inequalities and the possibilities of improvement in August, the AMERICAN AGRICULTURIST hardly ventures to make an estimate. The crop is growing on 78,867,889 acres, over half a million acres more than in 1889, but our preliminary estimate of yield indicates a reduction in product of over 400,000,000 bushels. This would bring the corn crop of 1890 down to about 1,700,000,000 bushels, against 2,112,892,000 bushels in 1889 and 1,456,000,000 bushels the previous year. The shortage is nearly half as great as the quantity of corn on hand in March of this year. In other words, the indications are that the yield is so curtailed that prices must be higher and steadily maintained. At best, it appears that there will be less corn on hand next March than the average for ten years. This means that farmers should receive an average of from five to fifteen cents per bushel more for this crop than for that of last year.

The Oat Crop will also be short. Its condition was only 81.6 on July 1 (one hundred points indicating a full stand), while August 1 this low state was still further reduced to 70.1, against 92.3 on August 1, 1889. The acreage is considerably less than last year also, fully 10 per cent. The AMERICAN AGRICULTURIST estimates that the crop can not be much over 500,000,000 bushels, against the 751,515,000 bushels harvested last year. The quality must in many cases be poor, but with such a remarkable shortage the present advance must be sustained.

In Spring Wheat there has been a considerable reduction in condition which averages 83.2 per cent for August 1 against 94.4 for July 1. The decline of seven points in the Dakotas is not high enough in our judgment and was owing to the hot Southern winds which affected the late sown more than the early. The Department estimates for August 1, supplemented by our own, lead to these figures, which justify expectations of a firm market at better prices than ruled last winter:

	Condition. '90.	'89.	Acreage.	Yield. (bush.)	Crop of 1889.
Wisconsin	80	90	1,156,967	12,809,187.6	16,937,000
Minnesota	80	93	3,673,819	46,657,501.3	45,456,000
Iowa	87	94	1,669,031	20,028,372	21,023,000
Nebraska	71	91	1,474,220	14,152,512	16,848,000
Dakotas	83	51	4,209,482	52,197,576.8	41,652,000
Totals	80.2	84.4	.....	135,845,149.7	141,916,000

Fruit. — Special reports to the *New England Homestead* show that the apple crop in the United States and Canada is less than for many years. It is best in the famous orchards of the Annapolis Valley, N. S., in Maine and in a limited area of Missouri and Kansas, of which Kansas City is the center. But throughout the rest of both countries there is hardly one-quarter of a crop. The great apple belt along the lakes in Ontario, Michigan, and New York has only from ten to fifty per cent of an average yield; and some counties in New York State that ship hundreds of thousands of barrels in a good year have no apples for export. Peaches are almost an entire failure everywhere. Pears and plums are uneven but not over half a crop, but grapes are better than usual and promise a full average yield if the ravages of black rot do not prove too disastrous. Higher prices are predicted for all fruits, and winter apples will be held for $4 and $5 per barrel.

Potatoes fell off in July from 91.7 to 77.4 on August 1. The crop has been much injured by drought, and while a low rate of yield is assured, the decrease will yet depend much upon the weather. Moisture and warmth from August 15 to September 15 may cause rot that will still further decimate the crop. The acreage is about the same as last year, and the total crop can not exceed 175,000,000 bushels against about 150,000,000 bushels last year and over 200,000,000 bushels in 1888. The high range of last year's prices can be kept up by judicious marketing.

Other Cereals.—Barley is down to 82.8, as its August condition, against 90.6 one year ago. The yield can not average over eighteen bushels per acre against twenty bushels last year, and the slightly increased acreage will not make up the loss. The Canada crop is not as good as in 1889, and if the higher duty imposed by the McKinley bill goes into effect, barley must take a big jump, and the area be immensely extended next season. Rye also stands at only 86.8 against 95.4 on August 1, 1889. Buckwheat will be about an average yield. The bean crop, especially the white pea and medium varieties, is less than usual.

In General.

Corn Huskers and Fodder Cutters.—The third annual catalogue of the Keystone Manufacturing Co., of Sterling, Ill., is of special interest to every farmer who raises corn. It is sent free on application.

A Salary, with expenses paid, will come handy to any one who is now out of employment; especially where no previous experience is required to get the position. If you want a position, see advertisement on Page 491, "A Chance to Make Money."

Now for Broilers.—The Monitor Incubators and Brooders, manufactured by A. F. Williams, Bristol, Conn., are enjoying a steadily increasing popularity, and any one intending to engage in artificial chicken-raising will find it to his advantage to send for the catalogue of this firm.

Artificial Limbs.—The perfection attained by A. A. Marks, 701 Broadway, New York, in the manufacture of artificial limbs is truly marvelous. Perhaps no more emphatic testimony could be offered than that of the man who wrote that after he had worn one of these limbs he felt as if he had been born with it.

Broadcast Sowing. — Before sowing your fall wheat and grass seed, do not fail to write to the Star Manufacturing Co., New Lexington, O., for circular and prices of their Automatic Star Broadcast Seeder. Endgate Seeders are becoming popular among farmers and none is more so than the Star, with its late improvements.

Veterinary Education.—The New York College of Veterinary Surgeons, the annual announcement of which appears in this issue of the AMERICAN AGRICULTURIST, is the pioneer veterinary college of the United States. It has a corps of able teachers and is well equipped in all respects for study and experiment. Its classes of students are increasing both in numbers and intellectuality.

Fitting the Land for Wheat. — In preparing stubble ground for wheat a great deal of labor is saved and a better seed-bed secured by pulverizing the soil with a good cultivator instead of plowing. An implement expressly adapted to this purpose is made and sold by the Johnston Harvester Company of Batavia, N. Y. It is equally useful in preparing for oats and barley in spring.

Dederick's Presses. — One of the most widely known agricultural appliances in the country is the Dederick press, manufactured by P. K. Dederick & Co., Albany, N. Y. It has been before the country for thirty years, undergoing continual improvements, each one covered by a separate patent. They press and bale, in a very effective manner, hay, straw, cotton, flax, wool, broom corn, hemp, rags, moss, hair, and stable litter. Send for the new catalogue.

A Business Change.—The firm of Savage & Farnum, of the famous Island Home Stock Farm, has been dissolved by the retirement of Mr. Geo. M. Savage. His interest was purchased by his partner, Mr. Herbert C. Farnum, in whose competent hands the business of importing and breeding Percheron and French draught horses will be continued. Situated on a beautiful island in Detroit river, this farm with its prize-winners has become one of the notable breeding farms of the country.

Stamping Out Disease.—When it is considered that the amount of the annual losses by swine disease is beyond computation, it is hard to understand why farmers should quietly suffer the loss of herd after herd when a sure preventive is so near at hand. Dr. Joseph Haas's hog remedy—the advertisement of which appears on another page of this number—is guaranteed to prevent swine disease, if properly fed, so that no one need be afraid of running any risk by making a trial of it, especially as Dr. Haas insures every hog fed with his remedy.

How to Have Strawberries Next Season. — Spring and autumn were formerly the only seasons in which it was considered safe to plant strawberries. But the method of raising plants in small pots, and shifting them without injury to the roots has so materially changed the culture of strawberries, that by planting good potted plants in August, a good crop of berries may be relied upon the following season. Prominent among those who make a specialty of potted strawberry plants, and who offer large collections of the choicest varieties, are Ellwanger & Barry, Rochester, N. Y., J. T. Lovett Co., Little Silver, N. J., and Peter Henderson & Co., New York. The latter firm makes also a specialty of celery plants which they raise by the millions.

The Victor Baling Press.—The hay- and straw-press made by Geo. Ertel & Co., Quincy, Ill., combines, in a notable degree, symmetry, simplicity, power, durability, speed of action, and ease of management. It is built in ten sizes, with respective capacity of from four to fourteen tons per day. Mr. Geo. Ertel deserves special mention,

(*Continued on Page* 491.)

'MURRAY' $55.95 BUGGIES FOR $53.15

Our Grand Reduction Sale of Buggies AND Harness

will be music in the ears of those who want to buy Buggies and Harness. Commencing Sept. 1st, and lasting for thirty days only, we will inaugurate the

GREATEST REDUCTION SALE ON RECORD,

and will allow a **Discount of 5 Per Cent** from any of the prices named in our catalogue. Although our Prices are now far below anything in the United States, we will, for the next thirty days, allow as above stated,

5 PER CENT OFF

any of our regular prices. This will make our

$5.95 Harness GO FOR $5.65

$55.95 Buggies GO FOR $53.15

and all other "Murray" Vehicles proportionately low.

Remember, this sale lasts only until Sept. 30. Positively no Goods sold at less than regular price after that date.

If you do not need a Buggy or Harness now, it will pay you to buy and keep them till you do, for at these prices they are bargains that come but once in a life-time.

LOOK HERE!!

We will positively sell not more than one Vehicle and one set of Harness to any one person. We have to adhere strictly to this rule, or the other factories would take this chance to buy of us and lay in a large stock at the reduced prices, as it is cheaper than they can build them themselves. If you have not our catalogue send immediately and get it; it contains the full description and net cash prices of all our world-renowned "Murray" Buggies and Harness, from which you can deduct the 5 per cent in ordering.

Remember, in buying these "Murray" Buggies and Harness at our regular price, that you are getting the biggest bargains in the world, and at this great reduction you are simply finding money.

WILBER H. MURRAY MANUFACT'G CO.,

"MURRAY BUILDING," 139 West Front St., CINCINNATI, OHIO.

A TIMELY BOOK, NOW READY!

THE CIDER MAKERS' HAND BOOK!

A COMPLETE GUIDE FOR MAKING AND KEEPING PURE CIDER.

BY J. M. TROWBRIDGE. Illustrated.

The author in his preface to this valuable book informs us that good pure cider is a greater rarity in this country than good wines, which seems strange in a country so abundantly blessed by Nature with apples, and where our mechanical intelligence has brought the necessary appliances to such perfection; yet we learn that three-fourths or more of all the cider made is spoiled either in the process of making or immediately after becoming cider, a fact which is attributed to a general lack of information of the plain, practical and simple requirements to be observed in the making and keeping of cider, rather than to any other cause. To correct some of the erroneous theories now accepted by those engaged in Cider-Making, and to be to others a **Hand Book** of practical instruction, is the object of this most valuable work. No treatise on this art has been published in many years, and it will be welcomed by thousands as a Standard Authority of practical information, based on exact scientific facts.

TABLE OF CONTENTS.

CHAPTER I.—Introductory 5
CHAPTER II.—The Properties of Cider 10
CHAPTER III.—Apple Juice 30
CHAPTER IV.—Apples, Varieties, and Tests 41
CHAPTER V.—Apparatus for Cider-Making 51
CHAPTER VI.—Straining and Filtering 68
CHAPTER VII.—Fermentation 79
CHAPTER VIII.—Pasteurization 91
CHAPTER IX.—Old Method of Cider-Making 101

Cloth, 12 Mo, fully illustrated, price, Post-paid $1.00.

ORANGE JUDD COMPANY, 52 & 54 LAFAYETTE PLACE, NEW YORK.

Recent Publications.

THE CIDER MAKERS' HAND BOOK: A Complete Guide for Making and Keeping Pure Cider. Illustrated. By J. M. Trowbridge. 12 mo. pp. 124. Cloth. Orange Judd Co., New York.

All the early English authors of books on agriculture and kindred subjects would have considered their works incomplete without a chapter or two on "cider-making." Two centuries ago the "wine of apples" was one of the important institutions of rural life in England, and from thence imported into America with the materials upon which it lived and flourished. But for some reason which it is not necessary for us to determine, our more modern authors of pomological works have almost entirely ignored the subject of cider-making, and we might suppose it was one of the lost domestic arts if it were not for the fact that barrels of cider annually roll down into the cellars of many thousands of our farmers who are so fortunate as to possess good orchards. We are inclined, however, to think that really good cider is not so very plentiful, and the inferior quality is no doubt due in a great measure to need of just such information as given in the "Cider Makers' Hand Book." Mr. J. M. Trowbridge, the author, treats the subject of cider-making scientifically from the selection of the apples as gathered from the trees to the finished product in the barrels or bottles, and there is not a point in the process so far as we have been able to discover that has been overlooked, and everything is explained in a practical way although based on exact scientific principles. This work is all the more welcome because it has no competitors in the field, and if the instructions given in its pages are followed the cider product of the country must soon take a far higher rank, and be far more generally esteemed as a wholesome beverage than ever before. Price, post-paid, $1.00.

ANNALS OF HORTICULTURE in North America for the year 1889. A witness of passing events and a record of progress. By Prof. L. H. Bailey. 12 mo. pp. 249. Rural Publishing Co., New York.

Busy workers have long felt the need of some condensed, accurate annual record of the most important horticultural events, discoveries, inventions, etc., for ready reference. To supply this need has been the object of the author who records in numerous chapters yields and prices of 1889; fruit-lists for various sections; recent tendencies in ornamental gardening; plant diseases and insects; national and educational interests; conventions of national societies; new introductions; catalogue of vegetables; directories of horticultural societies; horticulturists of experiment stations; botanic gardens of the world; seedsmen and nurserymen; new tools and conveniences; register of experimental literature, horticultural books and periodicals, necrology, etc. The amount of labor and time required to compile such a work can be but faintly conceived by those not familiar with similar undertakings; and while the author himself does not claim completeness and accuracy in every department of this first annual record, it contains enough valuable matter to make it indispensable in every horticultural library. Sold by the Orange Judd Co. Price post-paid, $1.

GEOLOGICAL SURVEY OF NEW JERSEY. Final report of the State Geologist. Published by the State.

Nearly the entire volume of 642 pages is devoted to the catalogue of plants found in New Jersey. This work was done by Dr. N. L. Britton. The State of New Jersey, although its area is only 8,224 square miles, contains most varied and diverse conditions of plant-growth, which explain the large number of species found within its boundaries. The total number of species and varieties enumerated is 5,641, the number of phenogamous plants is 1,919. The system of arrangement followed is that adopted by Bentham and Hooker in their Genera Plantarum. Great pains have been taken to verify the localities in which each species is found, and specimens of nearly all the species have been dried and mounted for the State herbarium. No more complete and accurate catalogue has ever been published in any country.

WINES AND VINES OF CALIFORNIA.—A Treatise on the Ethics of Wine-drinking. By Frona Eunice Wait. 8vo, pp. 215. The Bancroft Co., San Francisco, Cal.

The great diversity of soil and climate in California admit of the cultivation of nearly every variety of grapes grown anywhere, and consequently attempts have been made to produce almost every known brand of wine. To draw closer attention to the boundless viticultural resources of the State has been the principal aim of the author. The volume is richly illustrated and gives detailed descriptions of the various branches of the California wine industry, and especially of the principal vineyard districts and wine-making establishments. Sold by the Orange Judd Co. Price in cloth, post-paid, $1.00; in paper, 50 cents.

THE SALMON FISHER. By Charles Hallock. The Harris Publishing Co., N. Y.

No living writer on subjects pertaining to sports of flood and field stands higher in the confidence and regard of the American people than Charles Hallock. To a thorough and loving familiarity with the subjects he adds a clear, concise style of writing. In the work under notice he has condensed into 126 pages of miniature quarto a practical treatise on Salmon, how to catch them, and specific

(*Continued on Page* 490.)

CHILDREN

Are always liable to sudden and severe colds, to croup, sore throat, lung fever, etc. Remedies, to be effective, must be administered without delay. Nothing is better adapted for such emergencies than **Ayer's Cherry Pectoral.** It soothes the inflamed membrane, promotes expectoration, relieves coughing, and induces sleep. The prompt use of this medicine has saved innumerable lives, both of young and old.

"One of my children had croup. The case was attended by our physician, and was supposed to be well under control. One night I was startled by the child's hard breathing, and on going to it found it

Strangling.

It had nearly ceased to breathe. Realizing that the child's alarming condition had become possible in spite of the medicine it had taken, I reasoned that such remedies would be of no avail. Having a part of a bottle of Ayer's Cherry Pectoral in the house, I gave the child three doses, at short intervals, and anxiously waited results. From the moment the Pectoral was given, the child's breathing grew easier, and in a short time it was sleeping quietly and breathing naturally. The child is alive and well to-day, and I do not hesitate to say that Ayer's Cherry Pectoral saved its life."—C. J. Wooldridge, Wortham, Texas.

☞ For colds, coughs, bronchitis, asthma, and the early stages of consumption, take

Ayer's Cherry Pectoral,

PREPARED BY

DR. J. C. AYER & CO., Lowell, Mass.

Sold by all Druggists. Price $1; six bottles, $5

A PERFECT SUBSTITUTE
—FOR THE—

WHIFFLETREE.

ENERGETIC, RESPONSIBLE MEN

everywhere should secure exclusive territory for the sale of one of the most valuable inventions of the age, the **Webster Elastic Draught.** This invention consists of two elastic steel springs fastened to under side of crossbar, as shown in the cut, and can be attached to any vehicle or sleigh in 15 minutes. It removes all horse-motion; no shocks or jars; no sudden jerks or starts; no more noise or rattle; no catching of the reins or horse's tail. It gives greatest ease and comfort. It is far stronger and safer than the whiffletree, and presents a far neater appearance. It is the draught of the future. Thousands of them now used and indorsed by horsemen everywhere. Territory is extremely valuable, as the business is permanent and yields immense profits. Exclusive territory free. We guarantee satisfaction.

LOW & REWELL MFG. CO.,
104 Public Square, Cleveland, O.

BROWN'S FRENCH DRESSING

—FOR—

LADIES' AND CHILDREN'S BOOTS AND SHOES.

Awarded highest honors at

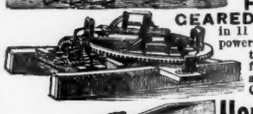
Phila.,	1876	Melbourne,	1880
Berlin,	1877	Frankfort,	1881
Paris,	1878	Amsterdam,	1883
New Orleans, 1884-85.			

Paris Medal on every bottle.

Beware of Imitations.

35 Years Experience. EVERY FARMER HIS OWN MILLER

Do your own Shelling and Grinding at Home, saving tolls and teaming to and from the Grist Mill. This work can be done rainy, windy days, when out-door work is suspended on the farm. The same Mill will cut corn stalks, saw wood, run churn, grindstone, pump water, etc. We make the

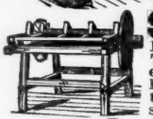


HALLADAY GEARED WIND MILL in 11 sizes, 1½ to 40 horse power, and GUARANTEE they have no equal for Power, Durability and Storm-Defying Qualities.

Horse Powers and JACKS both single and double Geared, made heavy and strong.

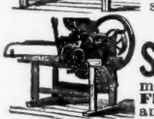
IXL 2 HOLE CORN Sheller

Adapted to run by hand, horse, steam or wind power. Not cheaply made, but strong, durable and effective in its working, yet light running. It is constructed similar to the large Power Shellers, and is the best 2-Hole Sheller on the market.



SAW TABLES

Both Swinging and Sliding Tables. We make a Saw Table especially adapted to sawing long poles. Special care is taken to make these machines strong and durable.



THE IXL STALK CUTTER made in 5 sizes, with **Safety Fly Wheel, Safety Lever,** and all late improvements.

THE IXL IRON FEED MILL

3 sizes, both Belt and Geared Mills. Can be run by any power, and especially adapted to Wind Power. Will grind any kind of grain, and is the lightest running and most effective Feed Grinder made.

IXL TANK HEATER

For warming water in Stock Tanks. Made of the best quality of iron cast in one piece, no sheet iron to rust or solder to melt and cause leak. Will burn any kind of fuel. It is very effective and takes less care to operate than any other Heater made.

We also make the **HALLADAY PUMPING WIND MILLS** 18 sizes; 8 to 60 ft. diameter, and one man to 40 horse power. The **U. S. SOLID WHEEL WIND MILL,** 7 sizes. **Iron and Brass Pumps** in great variety. **Tanks** all kinds and sizes, and the **Standard Hay Tools** consisting of **Anti-Friction, Swivel, Reversible** and **Red Hay Carriers, Harpoon** and **Grapple Horse Hay Forks, Pulleys, Floor Hooks, etc.** All goods fully guaranteed. Send for Catalogue and Prices. **Reliable Agents wanted** in all unassigned Territory.

U. S. WIND ENGINE & PUMP CO.,
BATAVIA, ILLINOIS, U. S. A.
BRANCH HOUSES:—Kansas City, Mo.; Omaha, Neb.
DEPOTS:—Boston, Mass.; Fort Worth, Texas.

IDEAL

20 Years Experience in one special line by practical, progressive people means something. Send for wind mill catalogue that tells all about it.

Stover Mfg. Co., 510 River St., FREEPORT, ILL.

MISSOULA Garden city of MONTANA. Railroad and manufacturing center, fine water power, rich agricultural lands, mines, lumber, etc. A prosperous city and rich country. Full particulars, including beautiful book, "MISSOULA ILLUSTRATED" SENT FREE upon application to FAIRCHILD, CORNISH & CO., MISSOULA, MONT.

HERE IS THE

HARNESS

That we are selling so many of at $5.50
Send P.O. order or registered letter and get a set with Over Check or Side Rein. We Defy Competition.

LOOK HERE! What the Public has to say about the BARKLEY GOODS.

NEW IBERIA, LA., June 7, '90.
Dear Sirs:—I have received the buggy in good order, and am perfectly satisfied with it. *I think it the most nicely finished buggy I have seen in this section of the country. Every one admires it.* MY WIFE IS HIGHLY PLEASED WITH IT.
I am very respectfully,
J. B. WINTERS.

GRANGEVILLE, IDAHO, June 16, 1890.
Dear Sirs:—The set of $5.50 harness that I ordered for Chas. Bentz, of this place, came O. K., and *every one here* WERE MUCH SURPRISED, AS THEY ARE AS GOOD AS HARNESS SOLD HERE FOR $20. Enclosed please find $10 for which please send your No. 6, $10 harness (nickel trimmed), by express to Frank [illegible]nsice.
Yours truly,
E. BECK, Postmaster.

MANCHESTER DEPOT, VT., June 30, 1890.
Gents:—The top buggy and road cart are at hand all O. K. They are VERY SATISFACTORY, and in every way appear fully equal to your representations. I think you may, in due time expect other customers from this locality, *as the goods are liked* BY ALL *who have seen them.* Yours very truly,
R. H. BRADLEY.

WE ALSO MANUFACTURE
GOAT HARNESS
from $1.50 to $16
and GOAT or DOG CARTS
at $4 and $7.
Write for
GOAT CATALOGUE.

For 20 consecutive years we have made and sold **HARNESS** to Dealers, BUT NOW we are selling direct to the consumers, saving you the traveling man' expenses and dealers' profits.

HARNESS $5.50, ROAD CARTS $13.50, BUGGIES, $55.00, upwards.

Write for Illustrated Catalogue and Prices.

FRANK B. BARKLEY MFG. CO., 271 & 273 Main St., CINCINNATI, O.

Blacksmithing on the Farm

with kit of tools for $20.00 or $25.00, consisting of the Holt portable Forge, the Combined Anvil and Vise, and a kit of regular blacksmith tools. In use in every State. Endorsed by thousands of FARMERS who have saved TIME and MONEY by their use. You can buy full kit or any part separately. Get our Net Cash Price List.
HOLT MFG. CO., 1901 First Av., Cleveland, O.

HARNESS | BUGGIES | ROAD CARTS
$5.00 and up. | $55. | $12.00 and up.
Sold direct to consumers. ONE PRICE. NO DEVIATION. WRITE FOR CATALOGUE.
D. RICE KEMPER & CO., CINCINNATI, OHIO.

Champion Evaporator.
For MAPLE, SORGHUM, CIDER, AND FRUIT JELLIES.

Corrugated pan ove. firebox, doubling boiling capacity. Small interchangeable syrup pans (connected by siphons), easily handled for cleansing and storing, and a Perfect Automatic Regulator. The *Champion* is as great an improvement over the Cook Pan as the latter was over the old iron kettle, hung on a fence rail.
The C. H. GRIMM MFG. CO.
Hudson, Ohio and Rutland, Vt.
Catalogues Free. Mention this paper.

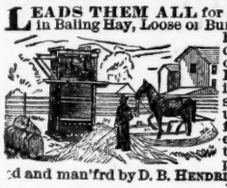
OHIO ENSILAGE AND FEED CUTTERS

The wide, open Throat and improved Feeding Device give our machines larger capacity than others. We are the originators of the Safety Fly Wheel, and have the best one in use. Catalogue of Cutters and Powers including Treatise on Ensilage and Plan for Silo, Free.
NEW FEATURES IN OUR CARRIERS FOR 1890.
SILVER & DEMING MAN'F'G CO., SALEM, OHIO.

THE "ACME"
AGRICULTURAL BOILER,
FOR COOKING FEED FOR STOCK, HEATING WATER, AND GENERATING STEAM FOR VARIOUS PURPOSES.
For Descriptive Circular and Price List, address the manufacturer,
C. H. C. DICKINSON,
KALAMAZOO, MICH.

Send your address immediately, on postal card, for our 80-page elegantly Illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.
Orange Judd Co., 52 & 54 Lafayette Place, N. Y.

LEADS THEM ALL for Ease & Rapid work in Baling Hay, Loose or Bundled Straw. Bands hooked with closed doors while horse is operating press. Bales of 200 lbs. made in three minutes; 24 sold and in general use within 8 miles of factory. Operated easier and faster than any other horse power press. Patented and man'frd by D. B. HENDRICKS, Kingston, N. Y.



CHAMPION HAY PRESSES
LEVER AND BELT POWER
ALL STEEL
OR WOOD AND STEEL AS DESIRED
SEND FOR CIRCULARS WITH PRICES.
FAMOUS MFG. CO. CHICAGO, ILL.

DO YOU WANT TO SAVE MONEY? See "Murray," page 487.

Recent Publications.

(*Continued from Page* 488.)

description of their haunts on the Atlantic shores. It is of special value to those who pursue this noblest of piscatorial sport. Sold by Orange Judd Co. Price $1.

PRACTICAL SANITARY AND ECONOMIC COOKING. Adapted to persons of moderate and small means. By Mary Hinman Abel. Published by American Health Association. Price 40 cents.

A committee acting for the American Public Health Association awarded to this essay a prize of $500 as the best of seventy presented. The committee emphasized the fact "that of all the essays submitted, the one selected is not only pre-eminently the best, but that it is also intrinsically an admirable treatise on the subject." Nothing need be added to this verdict from such a high and capable source.

MERE MENTION.

Recollections of Gen. Grant, by George W. Childs, is a little brochure which possesses peculiar interest on account of the strong personal friendship which was maintained between the great soldier and the eminent journalist. It shows Gen. Grant in the unrestrained freedom of intercourse with those he trusted.

Geneva.—An illustrated guide of Geneva, Switzerland, published by the Association of Commerce and Industry of that city. The book contains an excellent map and many other illustrations of that beautiful city, and a large amount of information relative to Swiss industries, history, educational institutions, etc. The work will be sent upon application to the New World Travel Co., 321 Broadway, New York.

American Association of Nurserymen.—Proceedings of the Fifteenth Annual Meeting held at New York. The promptness with which this handsomely gotten-up report has appeared is something phenomenal, and reflects no little credit upon the secretary, Mr. Chas. A. Green. In addition to the most valuable papers read, and the discussions thereon, the volume contains an excellent portrait of the president, Hon. S. M. Emery, and several handsome colored plates of fruits and ornamental shrubs.

CATALOGUES ACKNOWLEDGED.

M. Crawford, Cuyahoga Falls, O. Price list of strawberries, together with report on the leading varieties.

J. S. & W. G. Crosby, Eureka place, Greenville, Mich.: Catalogue of Shropshire sheep, Clydesdale and Cleveland bay horses, Shorthorn, Jersey, and Guernsey cattle, and Poland-China swine.

Henry A. Dreer, Philadelphia, Pa. Summer price list of strawberry plants, potted and layered. Celery and other vegetable plants. Seeds for fall sowing, greenhouse plants, etc.

Geo. Ertel & Co., Quincy, Ill. Illustrated and descriptive catalogue of the celebrated Ertel Baling Presses for hay, straw, moss and wool.

Ellwanger & Barry, Rochester, N. Y. Descriptive priced catalogue of potted and layer strawberries, embracing all the best old and new varieties. Also novelties and specialties for fall planting.

Geo. A. Lippincott, Huntsville, Ala. Trade list of the Spring City Nursery Co. A large stock of fruit and ornamental trees and shrubs for fall planting.

J. T. Lovett Co., Little Silver, N. J. Descriptive and illustrated price list of pot-grown and layer strawberry plants, together with valuable practical cultural directions.

S. E. Prather, Springfield, Ill. Catalogue of high-bred Shorthorn cattle and Southdown sheep.

T. Farrer Rockham, East Orange, N. J. Egg catalogue. A price list of eggs of the leading breeds of fowls.

James B. Wild & Bros., Sarcoxie, Mo. Wholesale and retail price list of Western-grown nursery stock. A large assortment of fruit and ornamental trees, shrubs, etc.

Keeping Eight Hundred Hens.—Conneaut, Ohio, intends to keep 800 hens and desires advice as to the number of houses and acres of land required for this purpose. To begin with, 800 hens is not advisable unless one has had practical experience. It is better to begin with a few and gradually enlarge. If you buy 800 hens you are liable to bring lice, roup, cholera, and other obstacles into your yards, as you must procure them from many sources. Every poultryman should begin with a small number, and raise his hens, using breeds adapted for the object in view. To keep 800 hens properly requires about ten acres of ground, a house 10x100 feet being allowed for 100 hens, with yards not less than 10x100 feet to each flock of ten or twelve hens, as they should be divided into small flocks. One male to ten or twelve hens should be allowed. The cost per year, for feed, would be about $800, but with so many hens the labor would be an item of cost, which is not estimated where a family has only a few hens, hence the reason that a few hens are more profitable than a large number. You will have to contend with quarrelsome males, domineering hens, lice, disease, and must also so manage that your hens can be given an opportunity to work and scratch, to avoid becoming overfat, and thereby failing to lay, as overfeeding must be guarded against.

My Head is Tired

Is a Common Complaint Just now. Both Mind And Body Are Made Strong By

Hood's Sarsaparilla.

Nothing On Earth Will

MAKE HENS LAY.

LIKE

Sheridan's Condition Powder!

It is absolutely pure. Highly concentrated. In quantity it costs less than a tenth of a cent a day. Strictly a medicine. Prevents and cures all diseases. Good for young chicks. Worth more than gold when hens Moult. "One large can saved me $40, send six for $5 to prevent roup," says a customer. If you can't get it send us 50 cents for two packs; five $1. A 2 1-4 pound can $1.20 post-paid; 6 cans $5, express paid. "THE BEST POULTRY PAPER," sample copy free. Poultry Raising Guide free with $1 orders or more. I. S. JOHNSON & Co., Boston, Mass.

DIAMOND ENGAGEMENT RINGS. Our $10 and $25 Engagement Rings are the largest and finest gems ever offered. On receipt of price we will send one to any address, and guarantee perfect satisfaction or refund the money at once. We have other rings for $20, $40, $50, $75, $100, $125, $150, $200, $250, $300, $350, $500, $1000 up, including Rubies, Sapphires, Pearls, Emeralds and all precious stones. Ear Rings, Studs, Buttons, Bracelets, Pendants and everything in fine Jewelry. Watches of every kind and price. Our Art Room is filled with fine paintings well worth seeing.

J. H. JOHNSTON & CO., 17 Union Square, New York. Established 1844.

A Saw Mill for light power at a low price was introduced first by us. Many are in use; many are wanted. If you want one remember that

$188.00—A Saw Mill For—$200.00

are our figures, and that no better, substantial, durable small mill can be found. Address the old stand,

The Lane & Bodley Co.

ESTABLISHED 1851. CINCINNATI, O.

BEFORE YOU BUY A STEAM ENGINE OR BOILER

SEND FOR OUR CATALOGUE AND PRICES

ATLAS ENGINE WORKS, INDIANAPOLIS, IND.

WOVEN WIRE FENCE

WIRE ROPE SELVAGE ALL SIZES MESH. PRICES REDUCED. Sold by dealers. Freight paid

STEEL CEMETERY and LAWN FENCE

McMULLEN'S FARM FENCING

50 INCHES HIGH AT 60 CENTS PER ROD.

Write to THE McMULLEN WOVEN WIRE FENCE CO., CHICAGO.

University of the State of New York.

American Veterinary College.

139 and 141 West 54th St., NEW YORK CITY

15th Annual Session.

The regular course of Lectures commences in Oct. each year. Circular and information can be had on application to Dr. A. LIAUTARD, V. M., Dean of the Faculty.

HAIR ON THE FACE, NECK, ARMS OR ANY PART OF THE PERSON

QUICKLY DISSOLVED AND REMOVED WITH THE NEW SOLUTION

MODENE

AND THE GROWTH FOREVER DESTROYED WITHOUT THE SLIGHTEST INJURY OR DISCOLORATION OF THE MOST DELICATE SKIN.

Discovered by Accident.—IN COMPOUNDING, an incomplete mixture was accidentally spilled on the back of the hand, and on washing afterward it was discovered that the hair was completely removed. We purchased the new discovery and named it MODENE. It is perfectly pure, free from all injurious substances, and so simple any one can use it. It acts mildly but surely, and you will be surprised and delighted with the results. Apply for a few minutes and the hair disappears as if by magic. It has no resemblance whatever to any other preparation ever used for a like purpose, and no scientific discovery ever attained such wonderful results. **IT CANNOT FAIL.** If the growth be light, one application will remove it permanently; the heavy growth such as the beard or hair on moles may require two or more applications before all the roots are destroyed, although all hair will be removed at each application, and without the slightest injury or unpleasant feeling when applied or ever afterward.—MODENE SUPERCEDES ELECTROLYSIS.—

—RECOMMENDED BY ALL WHO HAVE TESTED ITS MERITS—USED BY PEOPLE OF REFINEMENT.—

Gentlemen who do not appreciate nature's gift of a beard, will find a priceless boon in Modene which does away with shaving. It dissolves and destroys the life principle of the hair, thereby rendering its future growth an utter impossibility, and is guaranteed to be as harmless as water to the skin. Young persons who find an embarrassing growth of hair coming, should use Modene to destroy its growth. Modene sent by mail, in safety mailing cases, postage paid, (securely sealed from observation) on receipt of price, **$1.00** per bottle. Send money by letter, with your full address written plainly. Correspondence sacredly private. Postage stamps received the same as cash. (ALWAYS MENTION YOUR COUNTY AND THIS PAPER.)

LOCAL AND GENERAL AGENTS WANTED.

MODENE M'F'G CO., CINCINNATI, OHIO, U. S. A.

Manufacturers of high grade hair preparations.

Register your letter at any Post-office to insure its safe delivery

We offer $1,000 for failure or the slightest injury. EVERY BOTTLE GUARANTEED.

CUT THIS OUT AS IT MAY NOT APPEAR AGAIN

Matters of Business.

(*Continued from Page* 486.)

commencing as he did, back in the '60's' when the press of to-day was unheard of, and probably unthought of except in his inventive brain, and who, by his untiring energy has constantly improved and perfected his machine until to-day his factory is the largest exclusive hay-press manufactory in the world. Write to above address and get their new catalogue, which contains much valuable information.

Veterinary Education.—The sixteenth annual announcement of the American Veterinary College shows this sterling institution to be in full tide of successful usefulness. Few names are more widely and honorably known in connection with veterinary science than that of Dr. Alexander F. Liautard, who is still at the head of the talented faculty. The recognition by the French government of the diplomas of this college was one of the most brilliant events in the history of American veterinary medicine, and was a well-deserved tribute to the institution. Incidentally with its great work in veterinary education the college has done great good to poor owners of sick, or injured animals, treated freely in its clinics. Since its organization 6,663 animals of poor owners have received relief of which 729 were treated last year. The regular course commences with October. Circulars may be obtained free by addressing Dr. A. F. Liautard, Nos. 139 and 141 West 54th street, New York.

A Mathematical Problem.

G. W. Crain, Montgomery Co., Ohio: A problem belonging to the higher mathematics finds its way into arithmetical circles, as the following submitted by our correspondent: "The sum of two numbers is eight, and the sum of their cubes is 152. What are the numbers?" This is a question more properly solved by algebra, coming under the head of quadratic equations. It is generally asserted that questions of this kind can not be solved by purely arithmetical methods. While this may, perhaps, in the strictest sense be true, it is not at all difficult to find the true answer by the use of arithmetic alone. In cases where the numbers employed are large, the following process could not be so readily employed, but in the problem before us it appears to be the only entirely arithmetical solution, and is certainly simple. We introduce a series of hypotheses, subjecting each to the conditions proposed until we arrive at one which, while conforming to these, satisfies the equation. To solve the problem proposed, if we suppose 1 to be one of the numbers, the other will necessarily be 7, in order that their sum may be 8. Then we shall have 1 cubed=1, and 7 cubed=343. But, according to the second condition of the problem, the sum of these cubes should be 152. At a glance it is seen that the numbers employed fail to fill this requirement. For a second trial, we begin with 2, the number next in order; two from 8 leaves 6; 2 cubed=8, 6 cubed=216. Again, the second condition of the problem is not fulfilled. Employing 3, we subtract it from 8, and have 5 as a remainder. Cubing each number, we have respectively 27 and 125. The sum of these cubes is 152, and the last as well as the first condition of the problem is fulfilled, proving our final hypothesis correct.

Shall Never Give It Up.—The AMERICAN AGRICULTURIST is more than worth the money it costs. I shall never give it up while I have means to obtain it.
PHILIP EARMAN, Ulster Co., N. Y.

DEDERICK'S BALING PRESSES
Of all sizes and styles always on hand.

They are superior to all others in power, capacity and durability, for proof order on trial.

They are light, strong, cheap and durable. We make a full line of steel case presses.

Address for circulars and location of agents, P. K. DEDERICK & CO., 31 Dederick's Works, - - ALBANY, N. Y.

TREMONT COLLEGE OF MUSIC, Huntington Avenue, Boston, Mass. Music, Elocution, Languages, Painting, English Branches. Fifty teachers. Board for lady pupils from $5 to $7.50. Tuition $5 to $30. Prospectus mailed. MISS F. E. BRUCE, *President*.

FOR SALE.
500,000 APPLE SEEDLINGS, 2 YEARS OLD.
Address STEPHEN HOYT'S SONS, New Canaan, Ct.

NEW AND RARE PLANTS, ORCHIDS, ETC.
A Large Collection of Hot House and Green-House Plants, Carefully Grown, at Low Rates.
ORCHIDS—a very extensive stock: East Indian, Mexican, Central and South American, etc.
ROSES, CLEMATIS, DUTCH BULBS, etc.
FRUIT and ORNAMENTAL TREES, etc. Catalogues on application.
JOHN SAUL, Washington, D. C.

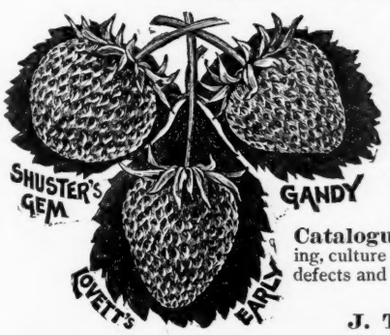
TREES FOR FALL PLANTING
The largest and most complete stock in the U.S. of Fruit and Ornamental *Trees, Shrubs, Peonies, Roses, Hardy Plants, Grape Vines, Small Fruits, &c.* Illustrated and descriptive priced *Catalogue*; also wholesale price list for the trade FREE. ELLWANGER & BARRY
MT. HOPE NURSERIES, ROCHESTER, N. Y.
50th Year. (*Mention this paper.*)

TREES, SHRUBS, ROSES, BULBS.

Full Line Fruit and Ornamental, Deciduous and Evergreen Trees, Grape-vines, Small-fruits, Shrubs, Roses, Winter-blooming, and Hardy-border Plants, Bulbs, Etc.
Standard and Dwarf Pears, Quince, Killmarnock Weeping Willows, European and Oak-leaf Mountain Ash
in large supply. Every Nurseryman, Dealer and Planter should send for our FREE CATALOGUE and PRICE LIST.

36TH YEAR.—700 ACRES.—24 GREENHOUSES.
THE STORRS & HARRISON CO., Painsville, Lake Co., Ohio.

THREE GRAND BERRIES.



Lovett's Early.—The only firm, prolific, handsome very early strawberry, of good size. **Shuster's Gem.**—The most valuable variety, ripening in mid-season. **Gandy.**—The latest; large and beautiful. Full descriptions and colored plate showing each berry, mailed free. *Dozen plants of each by mail for $2.50.*

An immense stock of FRUIT AND ORNAMENTAL TREES AND PLANTS, Nut Trees, &c. All the good old and choice new varieties. Quality unsurpassed; prices low. **Illustrated Fall Catalogue,** giving plain and practical instructions for purchasing, culture and management, with honest descriptions (telling both defects and merits), prices, etc. free to all.

Trees and Plants by mail a specialty.
J. T. LOVETT CO., Little Silver, N. J.

FAY CURRANT HEADQUARTERS. BEST & CHEAPEST GRAPES
NEW GRAPES Esther, Rockwood, Eaton, Moyer and all others New and Old. SMALL FRUITS. Catalogue Free. GEO. S. JOSSELYN, FREDONIA, N. Y.

PEACH TREES Wholesale and Retail. $30 to $60 per 1000. Circulars and price list free. Address D. S. MYER & SON, Bridgeville, Del.

A CHANCE TO MAKE MONEY.
Salary and Expenses paid, or Commission if preferred. Salesmen wanted everywhere. No experience needed. Address, stating age,
H. W. Foster & Co., Nurserymen, Box M, Geneva, N.Y.

WALLA WALLA. THE GARDEN CITY OF THE NORTHWEST.
For fruit culture, farming, fine stock raising, manufacturing, no better field. Delightful homes, pure water, ideal climate, every production.
Write to Board of Immigration, WALLA WALLA, WASHINGTON

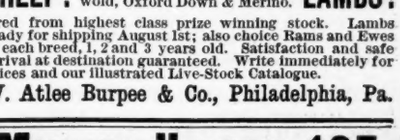
MONTANA. Persons desiring authoritative information concerning the agriculture, mines or manufactures of Montana, its resources and advantages, with industrial and labor statistics, can receive, postage FREE, pamphlets, maps, etc., or answer to special inquiries, by addressing
The Chamber of Commerce, Helena, Montana.

MADE WITH BOILING WATER.
EPPS'S
GRATEFUL—COMFORTING.
COCOA
MADE WITH BOILING MILK.

"GREEN MOUNTAIN GRAPE."
THE hardiest and best early grape yet introduced. Six days earlier than any variety tested at the Agricultural Experimental Grounds at Geneva, N. Y. Color, greenish white. Pulp tender, sweet and delicious. The only grape that ranks *first* both in earliness and quality. Each vine sealed with our trade-mark label. Our copyright name, "GREEN MOUNTAIN," secures us the exclusive right for its propagation for sale. Send for circulars giving further information. Agents wanted. Address.
STEPHEN HOYT'S SONS, New Canaan, Ct.

PEACH and other fruit trees, Carolina Poplars, Berry Plants. Good stock; low prices. S. C. DE COU, Moorestown, Burlington Co., N. J.

THE BEST CATTLE FASTENING!
SMITH'S
SELF-ADJUSTING SWING STANCHION!
THE only Practical Swing Stanchion Invented. Thousands in use. Illustrated circular free. Address,
F. G. PARSONS & CO., Addison, Steuben Co., N. Y.



Ohio IMPROVED Chesters
WARRANTED CHOLERA PROOF. EXPRESS PREPAID. WINS 1ST PRIZES IN U. S. & FOREIGN COUNTRIES. 2 WEIGHED 2806 LBS. SEND FOR DESCRIPTION & PRICE OF THESE FAMOUS HOGS, ALSO FOWLS.
L. B. SILVER CO. CLEVELAND, O.
(This company sold 1026 head for breeding purposes in 1888. Send for facts and mention this paper.)

SHEEP! Southdown, Shropshire, Cotswold, Oxford Down & Merino. LAMBS!
Bred from highest class prize winning stock. Lambs ready for shipping August 1st; also choice Rams and Ewes of each breed, 1, 2 and 3 years old. Satisfaction and safe arrival at destination guaranteed. Write immediately for prices and our illustrated Live-Stock Catalogue.
W. Atlee Burpee & Co., Philadelphia, Pa.

DO YOU WANT TO SAVE MONEY? See "Murray," page 487.

State, County and Other Fairs in 1890.

PREPARED EXPRESSLY FOR THE AMERICAN AGRICULTURIST.

[*Copyright by the Orange Judd Co.—Other periodicals will give credit when copying this list.*]

STATE AND PROVINCIAL FAIRS.

Alabama	Montgomery	Nov. 4-15
Am. Institute	New York	Oct. 1-Nov. 29
California	Sacramento	Sept. 8-20
Canada	Toronto	Sept. 8-20
Delaware	Dover	Sept. 29-Oct. 4
Delaware	Wilmington	Sept. 1-6
Georgia	Macon	Oct. 22-30
Illinois	Am. Fat Stock, Dairy and Poultry Show, Chicago	Nov. 13-22
Illinois	Am. Horse Show Chicago	Nov. 1-8
Illinois	Peoria	Sept. 29-Oct. 3
Indiana	Indianapolis	Sept. 22-27
Iowa	Des Moines	Aug. 29-Sept. 5
Kansas	Topeka	Sept. 12-20
Kentucky	Lexington	Aug. 26-30
Louisiana	Shreveport	Nov. 3-8
Maine	Lewiston	Aug 26-28
Michigan	Lansing	Sept. 9-12
Michigan	Detroit	Aug. 26-Sept. 5
Minnesota	Hamline	Sept. 5-12
Minnesota	Rochester	Sept. 1-5
Minnesota	Minneapolis	Aug. 20-29
Minnesota	St. Paul	Sept. 8-13
Missouri	St. Louis	Oct. 6-11
Montana	Helena	Aug. 23-30
Nebraska	Lincoln	Sept. 8-12
Nevada	Reno	Sept. 22-27
New Brunswick	St. John	Sept. 24-Oct. 4
New Hampshire	Tilton	Sept. 11-13
New Jersey	Trenton	Sept. 29-Oct. 3
New Jersey "Waverly Park"	Newark	Sept. 22-26
New York Inter-State Fair	Elmira	Sept. 1-12
New York	Syracuse	Sept. 11-18
New Mexico	Albuquerque	Sept. 15-20
North Carolina	Raleigh	Oct. 14-17
Ohio	Columbus	Sept. 15-19
Ohio (Tri-State)	Toledo	Sept. 8-13
Ontario	London	Sept. 18-27
Rhode Island	Narragansett Park	Sept. 22-26
South Carolina	Darlington	Oct. 30-Nov.1
South Dakota	Aberdeen	Sept. 15-19
Texas	Dallas	Oct. 18-Nov. 2
Texas	Bexar	Sept. 30-Oct. 11
Washington	Walla Walla	Oct. 6-11
West Virginia	Wheeling	Sept. 8-12
Wisconsin	Milwaukee	Sept. 15-20
Wyoming	Cheyenne	Sept. 15-20

ALABAMA.

Athens	Limestone	Sept. 30-Oct. 3
Madison	Huntsville	Oct. 21-25

ARIZONA.

Maricopa	Phoenix	Oct. 14-17

ARKANSAS.

Arkansas	Stuttgart	Oct. 27
Benton	Rogers	Sept. 30-Oct. 3
Bradley	Warren	Sept. 29
Drew	Monticello	Oct. 8-10
Independence	Batesville	Oct. 14-17
Hempstead	Hope	Oct. 21-25
Phillips	Helena	Oct. 21-25
White	Judsonia	Sept. 30-Oct.2

CALIFORNIA.

Fresno	Fresno City	Sept. 29-Oct.4
Napa	Napa City	Aug. 18-23
Plumas	Quincy	Sept. 22-28
Santa Barbara	Santa Barbara	Sept.23-26
Santa Clara	San Jose	Aug. 11-16

CALIFORNIA DISTRICT.

Inyo	Independence	Sept.23-26
San Luis Obispo	San Luis Obispo	Sept.2-6

COLORADO.

Larimer	Fort Collins	Sept. 23-26

CONNECTICUT.

Fairfield	Huntington	Sept. 24-25
Hartford	Southington	Sept. 9-11
Litchfield	Watertown	Sept. 23-25
Litchfield	New Milford	Sept 9-11
New Haven	Meriden	Sept. 16-19
New Haven	Guilford	Sept. 24
New Haven	Wolcott	Oct. 15
Tolland	Stafford Springs	Oct. 8-9
Tolland	Rockville	Sept. 9-11
Windham	Brooklyn	Sept. 16-18
Windham	Willimantic	Sept. 21-Oct. 2

ILLINOIS.

Adams	Cape Point	Sept. 1-5
Boone	Belvidere	Sept. 3-6
Brown	Mt. Sterling	Aug. 25-29
Bureau	Princeton	Sept. 9-12
Carroll	Mt. Carroll	Sept. 8-12
Cass	Virginia	Aug. 26-28
Champaign	Champaign	Aug. 26-29
Christian	Assumption	Sept. 2-5
Christian	Pana	Aug. 26-30
Coles	Charleston	Sept. 9-13
Crawford	Robinson	Sept. 9-12
DeKalb	Sycamore	Sept. 16-19
DeWitt	Clinton	Aug. 25-29
DeWitt	Farmers' City	Sept. 2-5
Douglas	Camargo	Aug. 19-22
Du Page	Wheaton	Sept. 9-11
Edgar	Paris	Sept. 1-5
Edwards	Albion	Sept. 23-26
Effingham	Watson	Sept. 25-26
Fayette	Vandalia	Sept. 30-Oct. 3
Ford	Piper City	Sept. 23-26
Franklin	Benton	Sept. 16-19
Fulton	Avon	Sept. 16-19
Fulton	Canton	Sept. 2-5
Gallatin	Shawneetown	Aug. 26-30
Greene	Carrollton	Sept. 30-Oct. 3
Hamilton	McLeansboro	Sept. 9-12
Hancock	Carthage	Sept. 8-12
Hancock	La Harpe	Sept. 1-5
Hancock	Warsaw	Sept. 3-Oct. 3
Henderson	Biggsville	Aug. 26-29
Henry	Cambridge	Aug. 25-29
Henry	Kewanee	Sept. 1-5
Hardin	Elizabethtown	Aug. 13-15
Iroquois	Milford	Aug. 19-22
Jasper	Newton	Sept. 16-19
Jersey	Jerseyville	Oct. 14-17
Jefferson	Mt. Vernon	Sept. 9-12
Jo Daviess	Warren	Sept. 16-19
Jo Daviess	Galena	Sept. 30-Oct. 3
Johnson	Vienna	Sept. 16-20
Kankakee	Kankakee	Sept. 9-12
Kendall	Yorkville	Sept. 2-5
Kendall	Yorkville	Sept. 2-5
Knox	Knoxville	Sept. 1-5
Lake	Libertyville	Sept. 16-19
La Salle	Mendota	Sept. 1-6
Livingston	Fairbury	Sept. 1-5
Logan	Atlanta	Sept. 2-5
Macon	Macon	Sept. 16-20
Macoupin	Carlinville	Sept. 2-5
Marion	Salem	Sept. 23-26
Marshall	Wenona	Sept. 1-5
Massac	Metropolis	Sept. 30-Oct. 3
McDonough	Bushnell	Aug. 19-22
McDonough	Macomb	Aug. 25-29
McHenry	Woodstock	Aug. 26-29
McLean	Bloomington	Sept. 15-19
Mercer	Aledo	Sept. 16-19
Menard	Petersburg	Sept. 2-5
Montgomery	Hillsboro	Sept. 9-12
Morgan	Jacksonville	Aug. 19-22
Moultrie	Sullivan	Sept. 2-6
Ogle	Rochelle	Sept. 9-12
Ogle	Oregon	Sept. 16-19
Peoria	Dunlap	Sept. 3-5
Perry	Pinckneyville	Oct. 7-10
Pike	Griggsville	Aug. 11-15
Pike	Barry	Aug. 5-8
Platt	Monticello	Aug. 18-22
Randolph	Chester	Oct. 14-17
Richland	Olney	Sept. 9-12
Rock Island	Port Byron	Sept. 3 5
Saline	Harrisburg	Sept. 23-26
Sangamon	Springfield	Sept. 8-12
Schuyler	Rushville	Aug. 18-22
Shelby	Moweaqua	Sept. 9-12
Shelby	Shelbyville	Sept. 16-20
Stark	Toulon	Sept. 16-19
Stark	Wyoming	Sept. 23-26
St. Clair	Belleville	Sept. 2-6
Tazewell	Mackinaw	Sept. 2-5
Tazewell	Delaware	Aug. 26-29
Union	Anna	Aug. 26-29
Union	Jonesboro	Sept. 9-12
Vermillion	Danville	Aug. 19-22
Vermillion	Hoopston	Aug. 25-29
Vermillion	Catlin	Sept. 2-5
Wabash	Mt. Carmel	Sept. 16-19
Warren	Monmouth	Sept. 9-12
Woodford	El Paso	Sept. 8-11
White	Carmi	Sept. 2-6
Whiteside	Morrison	Sept. 2-5
Winnebago	Rockford	Sept. 1-6

INDIANA.

Adams	Decatur	Sept. 2-5
Boone	Lebanon	Aug. 18-22
Carroll	Camden	Sept. 17-20
Clark	Charlestown	Sept. 1-5
Clinton	Frankfort	Aug. 25-30
Daviess	Loogootee	Sept. 10-13
Daviess	Washington	Sept. 29-Oct. 4
Dearborn	Lawrenceburg	Aug. 19-23
Decatur	Greensburg	Aug. 26-29
Delaware	Muncie	Aug. 19-22
DeKalb	Auburn	Sept. 8-12
Dubois	Huntingburg	Sept. 15-21
Elkhart	Goshen	Sept. 25-26
Fulton	Rochester	Sept. 3-6
Fountain	Covington	Sept. 14-19
Gibson	Princeton	Sept. 8-13
Grant	Marion	Aug. 26-29
Greene	Linton	Sept. 1-6
Hamilton	Sheridan	Sept. 1-5
Hancock	Greenfield	Aug. 19-22
Harrison	Corydon	Aug. 25-31
Henry	New Castle	Aug. 12-16
Howard	Kokomo	Sept. 9-13
Huntington	Huntington	Sept. 16-20
Huntington	Huntington	Sept. 16-20
Jackson	Brownstown	Sept. 22-26
Jay	Portland	Sept. 30-Oct. 3
Jennings	No. Vernon	Aug. 5-9
Johnson	Franklin	Sept. 16-20
Knox	Vincennes	Sept. 29-Oct.4
Lake	Crown Point	Sept. 30-Oct. 3
Laporte	Laporte	Sept. 31-Oct. 3
Lawrence	Bedford	Sept. 16-20
Madison	Anderson	Sept. 1-5
Marion	Lawrence	Sept. 9-12
Miami	Peru	Sept. 15-19
Montgomery	Crawfordsville	Sept. 8-12
Monroe	Bloomington	Sept. 8-12
Newton	Morocco	Sept. 9-12
Noble	Ligonier	Oct. 16-19
Owen	Spencer	Sept. 8.-13
Parke	Rockville	Aug. 18-22
Perry	Rome	Sept. 29-Oct. 4
Pike	Petersburg	Sept. 1-5
Porter	Valparaiso	Sept. 23-26
Posey	New Harmony	Sept.15-19
Pulaski	Winamac	Sept. 9-12
Putnam	Bainbridge	Sept. 1-5
Randolph	Winchester	Sept. 16-19
Ripley	Osgood	Aug. 12-16
Rush	Rushville	Sept. 9-13
Shelby	Shelbyville	Sept. 2-6
Spencer	Rockport	Sept. 22-27
Spencer	Chrisney	Sept. 29-Oct. 4
Steuben	Angola	Sept. 23-26
Sullivan	Sullivan	Sept. 8-13
Tippecanoe	Lafayette	Sept. 1-5
Tipton	Tipton	Aug. 11-15
Vermillion	Cayuga	Sept. 8-12
Vigo	Terre Haute	Aug. 25-29
Wabash	Wabash	Sept. 25-26
Warrick	Boonville	Oct. 6-11

INDIANA DISTRICT.

Blackford	Montpelier	Aug. 12-15
De Kalb	New Castle	Sept. 8-12
Hamilton	Arcadia	Aug. 25-29
Hamilton	Carmel	Aug. 27-29
Hamilton	Sheridan	Sept. 1-5
Henry	Knightstown	Aug. 26-30
Henry	Middletown	Aug. 5-8
Hendricks	No. Salem	Sept. 4-8
Howard	Poplar Grove	Sept. 29-Oct. 3
Huntington	Warren	Sept. 9-13
Jasper	Remington	Aug. 26-29
Kosciusko	Warsaw	Sept. 15-19
Martin	Loogootee	Sept. 10-13
Miami	Macy	Sept. 10-13
Montgomery	New Ross	Aug. 11-15
Noble	Kendallville	Sept. 29-Oct. 3
Parke	Bridgeton	Aug. 11-16
Posey	Mt. Vernon	Sept. 8-12
Pulaski	Francesville	Sept. 23-26
St. Joseph	South Bend	Sept. 15-19
Vermillion	Newport	Sept. 29-Oct. 3
Wabash	N. Manchester	Sept. 30-Oct. 3
Washington	Pekin	Sept. 16-19
Wayne	Dalton	Sept. 9-12

IOWA.

Adams	Corning	Sept. 22-26
Agency	Agency	Sept. 29-Oct. 2
Allamakee	Waukon	Sept. 16-19
Anamosa	Anamosa	Aug. 26-29
Appanoose	Moulton	Sept. 17-20
Appanoose	Centerville	Sept. 9-12
Audubon	Audubon	Sept. 17-20
Benton	Vinton	Sept. 9-12
Boone	Ogden	Sept. 16-19
Buena Vista	Alta	Sept. 10-12
Buena Vista	Alta	Sept. 10-12
Butler	Allison	Sept. 8-11
Calhoun	Rockwell City	Sept. 24-27
Carroll	Carroll	Sept. 8-11
Cass	Atlantic	Sept. 9-12
Cedar	Mechanicsville	Sept.9-12
Cedar	West Branch	Sept. 3-5
Clarke	Osceola	Aug. 26-29
Clayton	Garnaville	Sept. 9-12
Clinton	De Witt	Sept. 17-19
Cherokee	Marcus	Aug. 27-29
Cerro Gordo	Mason City	Sept. 23-25
Crawford	Denison	Sept. 16-18
Dallas	Adel	Sept. 23-29
Davis	Bloomfield	Aug. 26-29
Decatur	Leon	Aug. 27-29
Delaware	Manchester	Sept. 9-12
Des Moines	Burlington	Sept. 8-12
Dunlap	Dunlap	Sept. 24-26
Fayette	West Union	Sept. 2-5
Franklin	Hampton	Sept. 15-17
Floyd	Charles City	Sept. 9-12
Greene	Jefferson	Aug. 25-28
Grundy	Grundy Center	Sept. 16-18
Hamilton	Webster City	Sept. 16-19
Hancock	Britt	Sept. 10-12
Harrison	Missouri Valley	Sept. 29-Oct. 2
Hardin	Eldora	Sept. 9-12
Howard	Cresco	Aug. 26-29
Humboldt	Humboldt	Sept. 23-26
Ida	Battle Creek	Sept. 16-18
Iowa	Marengo	Sept. 9-12
Jackson	Maquoketa	Sept. 9-12
Jasper	Newton	Sept. 16-19
Jefferson	Fairfield	Sept. 9-12
Johnson	Iowa City	Aug. 25-28
Jones	Monticello	Sept. 2-5
Jones	Mechanicsville	Sept. 9-12
Keokuk	Sigourney	Sept. 9-12
Kossuth	Algona	Sept. 24-26
Lee	Donnellson	Sept. 2-9
Linn	Central City	Sept. 16-18
Linn	Mechanicsville	Sept. 2-15
Louisa	Wapello	Sept. 9-12
Lucas	Chariton	Sept. 30-Oct. 3
Lyon	Rock Rapids	Sept. 16-18
Madison	Winterset	Sept. 29-Oct.2
Mahaska	Oskaloosa	Aug. 25-28
Marion	Knoxville	Aug.19-2
Mills	Malvern	Sept. 23-25
Mitchell	Osage	Sept. 3-5
Monroe	Albia	Sept. 16-19
Montgomery	Red Oak	Sept. 16-19
Muscatine	Muscatine	Sept. 17-19
O'Brien	Sutherland	Sept. 17-19
Osceola	Sibley	Sept. 15
Page	Clarinda	Sept. 1-5
Page	Shenandoah	Sept. 9-12
Palo Alto	Emmetsburg	Oct. 1-3
Poweshiek	Grinnell	Sept. 8-11
Poweshiek	Malcolm	Oct. 6-9
Ringgold	Mt. Ayr	Sept. 9-12
Shelby	Harlan	Aug. 26-29
Shelby	Shelby	Oct. 1-3
Story	Nevada	Sept. 16-18
Tama	Toledo	Sept. 30-Oct. 2
Union	Afton	Sept. 17-19
Union	Mt. Liberty	Sept. 9-12
Van Buren	Keosauqua	Sept. 10-12
Wapello	Ottumwa	Aug. 18-22
Warren	Indianola	Sept. 16-19
Washington	Washington	Sept. 23-26
Wayne	Corydon	Sept. 15-19
Webster	Fort Dodge	Sept.30-Oct.3
Winneshiek	Decorah	Sept. 9-12
Winnebago	Forest City	Sept. 15-17
Worth	Worthwood	Sept. 9-11
Wright	Clarion	Sept. 16-18

IOWA DISTRICT.

Clayton	Strawberry Point	Sept. 16-19
Dallas	Perry	Sept. 24-27
Fayette	Brush Creek	Sept. 9-12
Harrison	Dunlap	Sept. 23-25
Henry	Winfield	Sept. 2-5
Jones	Anamosa	Aug. 26-29
Keokuk	Richland	Sept. 16-19
Lee	Keokuk	Aug. 12-15
Mahaska	New Sharon	Sept. 16-19
Muscatine	W. Liberty	Sept. 9-12
O'Brien	Sheldon	Sept. 2-3
Sac	Odebolt	Sept. 10-12
Scott	Davenport	Sept. 22-26
Scott	Mt. Joy	Sept. 9-12
Tama	Traer	Aug. 26-28
Taylor	Lenox	Oct. 1-4
Van Buren	Milton	Sept. 9-12
Wapello	Agency City	Sept. 29-Oct. 2
Wayne	Lineville	Sept. 30-Oct. 3

KANSAS.

Anderson	Garnett	Aug. 26-29
Atchison	Atchison	Sept. 8-13
Barber	Kiowa	Oct. 1-3
Bourbon	Fort Scott	Sept. 23-26
Brown	Hiawatha	Sept. 9-12
Chase	Cottonwood Falls	Sept. 23-25
Cheyenne	St. Francis	Sept. 24-26
Coffey	Burlington	Sept. 8-12
Cowley	Winfield	Sept. 2-4
Crawford	Girard	Sept. 23-26
Dickinson	Hope	Sept. 2-5
Elles	Hays City	Sept. 15-18
Franklin	Ottawa	Sept. 2-5
Ford	Ford	Sept. 17-19
Graham	Hill City	Sept. 25-27
Jefferson	Oskaloosa	Sept. 9-12
Johnson	Edgerton	Sept. 9-12
Linn	La Cygne	Sept. 23-26
Lincoln	Lincoln	Sept. 18-20
Linn	Mound City	Sept. 16-19
Logan	Russell Springs	Sept. 24-26
Montgomery	Independence	Sept. 2-5
Morris	Council Grove	Sept. 23-25
Nemaha	Seneca	Sept. 16-19
Osage	Burlingame	Sept. 9-12
Rawlins	Atwood	Sept. 25-27
Rush	La Crosse	Sept. 24-26
Sumner	Wellington	Aug. 26-29
Shawnee	Topeka	Sept. 12-20

KENTUCKY.

Adair	Columbia	Aug. 19-22
Anderson	Lawrenceburg	Aug 19-22
Bourbon	Paris	Sept. 2-6
Boyle	Danville	Aug. 5-8
Caldwell	Princeton	Oct. 8-11
Clark	Winchester	Sept. 9-13
Christian	Hopkinsville	Oct. 15-19
Daviess	Owensboro	Oct. 7-11
Fayette	Lexington	Aug. 26-29
Hardin	Elizabethtown	Sept. 9-12
Harrison	Cynthiana	Sept. 16-20
Hart	Horse Cave	Sept. 16-19
Henderson	Henderson	Sept. 30-Oct. 4
Henry	Eminence	July 23-27
Laurel	London	Aug. 28-30
Madison	Richmond	Sept. 16-20
Mason	Maysville	Aug. 19-23
Muhlenburg	Greenville	Oct. 15-19
Nelson	Bardstown	Sept. 2-7
Ohio	Hartford	Oct. 1-5
Pulaski	Somerset	Sept. 9-12
Shelby	Shelbyville	Aug. 26-29
Union	Uniontown	Aug. 20-24
Warren	Bowling Green	Sept. 2-6
Washington	Springfield	Aug. 28-Sept. 1

KENTUCKY DISTRICT.

Jefferson	Fern Creek	Aug. 19-21

MAINE.

Aroostook	Houlton	Sept. 24-25
Cumberland	Gray	Aug 26-28
Cumberland	Naples	Sept. 23
Franklin	Farmington	Sept. 30-Oct. 2
Lincoln	Damariscotta	Sept. 23-26
Oxford	Canton	Sept. 23-25
Penobscot	Exeter	Sept. 23-25
Sagadahoc	Topsham	Oct. 14-16
Somerset	Skowhegan	Sept. 16-18
York	Springdale	Sept. 30-Oct. 2

MARYLAND.

Baltimore	Timonium	Sept. 2-5
Cecil	Elkton	Oct. 7-10
Frederick	Frederick City	Oct. 14-17
Harford	Bel Air	Sept. 30-Oct. 3
Montgomery	Rockville	Sept. 3-5
Washington	Hagerstown	Oct. 14-17

MASSACHUSETTS.

Barnstable	Barnstable	Sept.9-10
Berkshire	No. Adams	Sept. 16-18
Berkshire	Pittsfield	Sept. 9-12
Berkshire	Gt. Barrington	Sept. 24-26
Bristol	Taunton	Oct. 7-10
Franklin	Charlemont	Sept. 11-12
Franklin	Greenfield	Sept. 25-26
Hampden	Blandford	Sept. 10-12
Hampden	Palmer	Sept. 16-17
Hampshire	Northampton	Oct. 1-3
Middlesex	Framingham	Sept. 9-10
Middlesex	Lowell	Sept. 23-25
Nantucket	Nantucket	Sept. 3-4
Plymouth	Brockton	Oct. 1-4
Plymouth	Hingham	Sept. 23-24
Plymouth	Bridgewater	Sept. 17-20
Worcester	Oxford	Sept. 16-17
Worcester	Fitchburg	Sept. 23-24
Worcester	Athol	Sept. 30-Oct. 1
Worcester	Sturbridge	Sept. 11-12
Worcester	Barre	Sept. 25-26
Worcester	Uxbridge	Sept. 23-24
Worcester	Worcester	Sept. 2-5

MICHIGAN.

Antrim	Bellaire	Sept. 30-Oct. 2
Bay	Bay City	Sept. 30-Oct. 3
Barry	Hastings	Sept. 23-26
Calhoun	Marshall	Sept. 30-Oct. 3
Eaton	Charlotte	Sept. 30-Oct. 3
Genesee	Flint	Sept. 30-Oct. 3
Hillsdale	Hillsdale	Sept. 29-Oct.3

Kalamazoo	Kalamazoo	Sept.30-Oct.3
Lapeer	Lapeer	Sept. 22-24
Lenawee	Adrian	Sept. 22-26
Macomb	Armada	Oct. 1-3
Macosta	Big Rapids	Sept. 30-Oct. 2
Midland	Midland	Oct. 9-12
Oakland	Pontiac	Sept. 30-Oct. 3
Oceana	Hart	Sept. 23-26
Washtenaw	Ann Arbor	Sept. 30-Oct.3
Wayne	Grosse Point	Sept. 15-19

MICHIGAN DISTRICT.

Tuscola	Caro	Sept. 30-Oct. 3

MINNESOTA.

Fillmore	Preston	Sept. 16-19
Lac-Qui-Parle	Madison	Sept. 18-20
Mower	Austin	Sept. 16-18
Nicollet	St. Peter	Sept. 18-20
Ramsey	Hamline	Sept. 8-13
Stearns	St. Cloud	Sept. 16-19
Todd	Long Prairie	Sept. 23-25

MISSOURI.

Barton	Lamar	Sept. 29-Oct. 3
Boone	Columbia	Aug. 12-16
Callaway	Fulton	Aug. 12-17
Carroll	Carrollton	Sept. 9-13
Cass	Belton	Aug. 19-23
Charlton	Keytesville	Oct. 7-12
Dade	Lockwood	Oct. 7-10
Daviess	Jamesport	Sept. 2-5
Franklin	Washington	Sept. 4-6
Gasconade	Hermann	Aug. 29-30
Gentry	Albany	Aug. 26-29
Greene	Springfield	Sept. 9-13
Harrison	Ridgeway	Sept. 9-12
Jasper	Carthage	Sept. 16-19
Johnson	Holden	Aug. 26-29
Knox	Newark	Sept. 9-13
Lincoln	Troy	Sept. 2-5
Livingston	Avalon	Sept. 2-5
Macon	La Plata	Sept. 9-12
Marion	Palmyra	Sept. 30-Oct. 4
Moniteau	California	Sept. 16-19
Pettis	Sedalia	Aug. 19-23
Putnam	Unionville	Aug. 27-30
Schuyler	Lancaster	Sept. 10-13
St. Charles	St. Charles	Sept. 10-12

MISSOURI DISTRICT.

Caldwell	Hamilton	Aug. 26-30
Cape Girardeau	Cape Girardeau	Oct.14-18
Ray	Lawson	Aug. 19-22

NEBRASKA.

Adams	Hastings	Sept. 2-4
Antelope	Neligh	Sept. 24-26
Brown	Long Pine	Sept. 17-20
Buffalo	Kearney	Sept. 16-19
Burt	Tekamah	Sept. 30-Oct. 3
Butler	David City	Sept. 23-26
Cheyenne	Sidney	Sept. 17-19
Clay	Clay Center	Sept. 16-19
Chase	Imperial	Sept. 17-19
Colfax	Schuyler	Sept. 17-19
Dawson	Lexington	Sept. 23-26
Dodge	Fremont	Sept. 30-Oct. 3
Douglas	Omaha	Sept. 1-5
Frontier	Stockville	Sept. 17-19
Fillmore	Geneva	Sept. 16-19
Franklin	Bloomington	Sept. 24-26
Furnas	Beaver City	Sept. 16-18
Hall	Grand Island	Sept. 16-19
Harlan	Orleans	Sept. 3-5
Hayes	Hayes Center	Oct. 1-4
Hitchcock	Culbertson	Sept. 16-19
Holt	O'Neill	Oct. 1-4
Jefferson	Fairbury	Sept. 23-26
Johnson	Tecumseh	Oct. 7-10
Kearney	Minden	Sept. 23-26
Lancaster	Lincoln	Sept. 5-12
Madison	Madison	Sept. 17-19
Merrick	Central City	Sept. 17-20
Nemaha	Auburn	Sept. 30-Oct. 3
Perkins	Madrid	Sept. 23-26
Polk	Osceola	Sept. 2-5
Richardson	Falls City	Sept. 1-5
Sarpy	Papillion	Sept. 3-5
Sarpy	Papillion	Sept. 17-19
Saunders	Wahoo	Sept. 2-4
Seward	Seward	Sept. 24-27
Stanton	Stanton	Sept. 30-Oct. 3
Thayer	Hebron	Sept. 17-20
Valley	Ord	Sept. 23-26
Webster	Red Cloud	Sept. 30-Oct. 3
York	York	Sept. 23-25

NEW HAMPSHIRE.

Merrimack	Tilton	Sept. 10-12

NEW JERSEY.

Atlantic	Egg Harbor City	Sept. 20-22
Burlington	Mt. Holly	Sept. 8-12
Cumberland	Bridgeton	Aug. 20-21
Cumberland	Vineland	Sept. 2-4
Salem	Woodstown	Aug. 26-28
Somerset	Somerville	Sept. 9-11
Sussex	Newton	Oct. 7-10

NEVADA.

Washoe	Reno	Sept. 22-27

NORTH CAROLINA.

Gaston	Mount Holly	July 28-Aug. 2

NEW YORK.

Allegany	Angelica	Sept. 9-12
Allegany	Cuba	Sept. 23-26
Broome	Whitney's Point	Sept. 1-4
Chenango	Sherburne	Sept. 15-18
Clinton	Plattsburgh	Sept. 9-12
Columbia	Chatham	Sept. 2-5
Columbia	Hudson	Aug. 26-29
Delaware	Delhi	Sept. 4-6
Dutchess	Poughkeepsie	Sept. 9-12
Essex	Westport	Sept. 2-4
Fulton	Johnstown	Sept. 8-11
Genesee	Batavia	Sept. 18-20
Lewis	Lowville	Sept. 16-19
Livingston	Geneseo	Sept. 30-Oct. 2
Monroe	Rochester	Sept. 22-26
Montgomery	Fonda	Sept. 1-4
Niagara	Lockport	Sept. 25-27
Ontario	Canandaigua	Sept. 24-26
Orleans	Albion	Sept. 25-27
Oswego	Oswego	Sept. 2-5
Otsego	Cooperstown	Sept. 22-24
Putnam	Carmel	Aug. 19-22
Queens	Mineola	Sept. 23-26
Rockland	Spring Valley	Sept. 23-26
Schoharie	Cobleskill	Sept. 29-Oct. 2
Schoharie	Schoharie	Sept. 22-25
Seneca	Waterloo	Sept. 24-26
Steuben	Bath	Sept. 30-Oct. 3
St. Lawrence	Canton	Sept. 16-19
Suffolk	Riverhead	Sept. 30-Oct.3
Sullivan	Monticello	Sept. 2-4
Tioga	Owego	Sept. 9-11
Tompkins	Ithaca	Sept. 9-12
Washington	Fort Edward	Sept. 8-12
Wayne	Lyons	Sept. 22-25
Westchester	White Plains	Sept. 29-Oct. 4
Yates	Penn Yan	Sept. 23-25

OHIO.

Adams	West Union	Sept. 23-26
Allen	Lima	Sept. 9-12
Ashland	Ashland	Sept. 2-5
Auglaize	Wapakoneta	Sept. 30-Oct. 6
Ashtabula	Jefferson	Sept. 23-24
Belmont	St. Clairsville	Sept. 2-4
Butler	Hamilton	Oct. 6-10
Brown	Georgetown	Oct. 7-10
Carroll	Carrollton	Sept. 30-Oct. 3
Champaign	Urbana	Aug. 26-29
Clark	Springfield	Sept. 8-12
Clermont	New Boston	Sept. 1-5
Clermont	Owensville	Sept. 1-6
Clinton	Sabina	Aug. 19-22
Clinton	Wilmington	Sept. 9-12
Columbiana	New Lisbon	Sept. 23-25
Coshocton	Coshocton	Oct. 7-10
Crawford	Bucyrus	Sept. 23-26
Cuyahoga	Chagrin Falls	Sept. 9-12
Drake	Greenville	Sept. 8-12
Defiance	Defiance	Sept. 2-5
Delaware	Delaware	Sept. 9-12
Erie	Sandusky	Sept. 16-19
Fayette	Washington C. H.	Aug. 26-29
Fulton	Ottokee	Sept. 23-26
Gallia	Gallipolis	Aug. 12-15
Geauga	Burton	Sept. 2-5
Greene	Xenia	Sept. 2-5
Guernsey	Washington	Sept. 30-Oct. 3
Hancock	Findlay	Sept. 24-27
Hardin	Kenton	Sept. 2-5
Hardin ("Tri-County")	Ada	Aug. 26-29
Harrison	Cadiz	Sept. 16-19
Henry	Napoleon	Sept. 9-12
Highland	Hillsboro	Aug. 5-8
Hocking	Logan	Oct. 1-4
Holmes	Millersburg	Sept. 30-Oct. 3
Huron	Norwalk	Sept. 9-12
Jefferson	Smithfield	Sept. 24-26
Knox	Mt. Vernon	Sept. 23-26
Lake	Painesville	Aug. 26-29
Lawrence	Ironton	Sept. 10-12
Licking	Newark	Sept. 30-Oct. 3
Licking	Pataskala	Sept 9-12
Licking	Hartford	Sept. 23-26
Logan	Bellefontaine	Sept. 30-Oct. 3
Lorain	Elyria	Sept. 23-26
Madison	London	Sept. 2-5
Marion	Marion	Sept. 30-Oct. 3
Medina	Medina Village	Sept. 2-4
Miami	Troy	Sept. 29-Oct. 4
Monroe	Woodsfield	Aug. 26-28
Morgan	McConnellsville	Sept. 8-11
Morrow	Mt. Gilead	Oct. 7-10
Muskingum	Zanesville	Sept. 2-5
Noble	Sarahsville	Sept. 10-12
Noble	Ligonier	Sept. 16-19
Ottawa	Port Clinton	Sept. 24-26
Paulding	Paulding	Sept. 9-12
Perry	New Lexington	Aug. 27-29
Perry	Somerset	Oct. 20-23
Pickaway	Circleville	Sept. 2-5
Preble	Eaton	Sept. 22-25
Portage	Ravenna	Sept. 16-19
Putnam	Ottawa	Sept. 30-Oct. 4
Richland	Mansfield	Sept. 30-Oct. 3
Ross	Chillicothe	Aug. 12-13
Sandusky	Fremont	Sept. 30-Oct. 3
Sandusky	Clyde	Sept. 23-26
Seneca	Fostoria	Sept. 2-5
Seneca	Tiffin	Sept. 23-26
Shelby	Sidney	Sept. 23-26
Starke	Canton	Sept. 22-26
Starke	Marlboro	Oct. 2-4
Trumbull	Warren	Sept. 9-12
Tuscarawas	Canal Dover	Sept. 30-Oct. 3
Union	Marysville	Sept. 23-26
Van Wert	Van Wert	Sept 2-5
Warren	Lebanon	Aug. 26-29
Washington	Marietta	Sept. 16-18
Wayne	Wooster	Sept. 23-26
Wood	Bowling Green	Sept. 30-Oct. 4

OHIO DISTRICT.

Scioto	Portsmouth	Aug. 5-8

PENNSYLVANIA.

Armstrong	Parker's Landing	Sept. 15-18
Beaver	Beaver	Sept. 23-26
Beaver	Hookstown	Aug. 19-22
Berks	Reading	Sept. 16-19
Bradford	East Towanda	Sept. 23-26
Bradford	Troy	Aug. 26-28
Bucks	Doylestown	Sept. 23-26
Butler	Butler	Sept. 9-12
Cambria	Carrolltown	Sept. 9-12
Carbon	Lehighton	Oct. 7-10
Chester	West Chester	Sept. 18-20
Chester	Oxford	Sept. 24-26
Chester	Phoenixville	Oct. 1-3
Clarion	Clarion	Sept. 23-26
Columbia	Bloomsburg	Oct. 15-18
Columbia	Berwick	Sept. 3-6
Columbia	Benton	Oct. 1-4
Crawford	Cambridgeboro	Sept. 16-19
Dauphin	Gratz	Sept. 23-26
Erie	Corry	Sept. 16-19
Fayette	Uniontown	Oct. 9-12
Greene	Carmichael	Sept. 10-12
Indiana	Indiana	Sept. 30-Oct. 3
Jefferson	Punxsutawney	Sept. 16-19
Jefferson	Brookville	Sept. 9-12
Juniata	Port Royal	
Lackawanna	Scranton	Sept. 22-25
Lawrence	New Castle	Aug. 26-29
Luzerne	Wyoming	Sept. 9-12
Lebanon	Lebanon	Sept. 2-6
Lehigh	Allentown	Sept. 30-Oct. 3
Luzerne	Dallas	Sept. 2-5
Lycoming	Hughesville	Oct. 8-11
Mercer	Mercer	Sept. 8-10
Mercer	Stonesboro	Sept. 24-26
Monroe	Stroudsburg	Sept. 3-5
Montgomery	Pottstown	Sept. 23-26
Montour	Washingtonville	Oct.7-10
Northampton	Nazareth	Oct. 7-10
Northumberland	Milton	Oct. 1-4
Perry	Newport	Sept. 16-19
Schuylkill	Orwigsburg	Sept. 30-Oct. 3
Sullivan	Dushore	Oct. 1-3
Susquehanna	Harford	Sept. 24-25
Susquehanna	Montrose	Oct. 1-2
Tioga	Wellsboro	Sept. 2-5
Tioga	Marshfield	Sept. 23-26
Tioga	Wellsboro	Sept. 2-5
Warren	Warren	Sept. 9-12
Washington	Washington	Sept. 1-5
Washington	Burgettstown	Sept. 30-Oct. 2
Wayne	Honesdale	Sept. 23-25
Westmoreland	Greensburgh	Oct. 7-10
Wyoming	Tankhannock	Sept. 17-19
York	Hanover	Sept. 9-12
York	York	Oct. 6-11

RHODE ISLAND.

Washington	Kingston	Sept. 16-18

SOUTH CAROLINA.

Charleston	Charleston	Jan. 13-17
Richland	Columbia	Nov. 11-14

SOUTH DAKOTA.

Clay	Vermillion	Sept. 9-12
Deuel	Cary	Sept. 23-25
Turner	Parker	Sept. 24-26

TENNESSEE.

Bedford	Shelbyville	Sept. 18-20
DeKalb	Alexandria	Sept. 24-25
Gibson	Trenton	Oct. 14-19
Giles	Pulaski	Sept. 23-27
Lincoln	Fayetteville	Oct. 14-18
Mary	Columbia	Sept. 16-20
Marshall	Lewisberg	Oct. 7-9
Montgomery	Clarksville	Oct. 8-11
Robertson	Springfield	Sept. 3-6
Rutherford	Murfreesboro	Sept. 9-13
Smith	Rome	Sept. 4-6
Smith	Dixon Springs	Aug.27-30

VERMONT.

Franklin	Sheldon Junction	Sept. 3-5
Rutland	Fair Haven	Sept. 23-26
Rutland	Rutland	Sept. 9-11
Washington	Waitsfield	Sept. 3-4
Windham	Brattleboro	Oct. 1-2
Windsor	Woodstock	Sept. 23-25

VIRGINIA.

Augusta	Staunton	Sept. 30-Oct. 3
Botetourt	Fincastle	Sept. 25-27
Fairfax	Grange Camp	Aug. 4
Lancaster	Kilmarnock	Nov. 6-8
Loudoun	Leesburg	Aug. 26-28
Northampton	Cape Charles City	Aug. 18-23
Prince George	Prince George	Oct. 15-17
Prince Edward	Farmville	Oct. 15-17
Shenandoah	Woodstock	Oct. 7-10
Spottsylvania	Fredericksburg	Sept. 30-Oct. 2
Tazewell	Tazewell	Sept. 30-Oct. 2

WEST VIRGINIA.

Harrison	Clarksburg	Sept. 2-4
Mason	Mount Pleasant	Aug. 26-29
Monroe	Alderson	Sept. 16-18
Ohio	Wheeling	Sept. 8-12
Ritchie	Pennsboro	Aug. 26-28
Tyler	Middlebourne	Sept. 3-5
Wetzel	New Martinsville	Aug. 26-28

WISCONSIN.

Adams	Friendship	Sept. 23-25
Barron	Chetek	Sept. 10-12
Barron	Shetek	Sept. 10-12
Brown	De Pere	Sept. 3-5
Brown	Green Bay	Sept. 9-12
Burnett	Grantsburg	Sept. 20
Clark	Neillsville	Sept. 11-13
Columbia	Portage	Sept. 9-11
Columbia	Portage	Sept. 9-12
Dane	Madison	Sept. 23-26
Fond du Lac	Fond du Lac	Sept. 10-12
Grant	Bloomington	Sept. 10-12
Grant	Lancaster	Sept. 17-19
Green	Monroe	Sept. 10-13
Iowa	Dodgeville	Aug. 27-29
Jackson	Black River Falls	Sept. 8-10
Jefferson	Jefferson	Sept. 2-5
Juneau	Mauston	Sept. 23-25
Kewaunee	Kewaunee	Sept. 3-5
La Crosse	West Salem	Sept. 30-Oct. 2
La Fayette	Darlington	Sept. 9-12
Manitowoc	Manitowoc	Sept. 8-11
Marathon	Wausau	Aug. 26-21
Outagamie	Seymour	Sept. 15-17
Ozaukee	Cedarburg	Sept. 23-25
Ozaukee	Cedarburgh	Sept. 23-25
Pierce	Ellsworth	Sept. 24-26
Pepin	Durand	Sept. 10-12
Pierce	Ellsworth	Sept. 24-26
Portage	Amherst	Sept. 16-18
Racine	Racine	Sept. 2-5
Richland	Richland Center	
Rock	Janesville	Sept. 9-12
Sheboygan	Sheboygan	Sept. 23-26
Trempealeau	Arcadia	Sept. 17-19
Vernon	Viroqua	Sept. 24-26
Walworth	Elkhorn	Sept. 23-26
Waukesha	Waukesha	Aug. 26-29

CANADA.

Blandford	Woodstock	Sept. 30-Oct. 1
Brant	Brantford	Sept. 9-11
Brant	Paris	Oct. 7-8
Bruce	Paisley	Sept. 24-26
Bruce	Walkerton	Sept. 30-Oct. 4
Carleton	Ottawa	Sept. 22-27
Elgin	Belmont	Oct. 2
Elgin	St. Thomas	Sept. 16-18
Elgin	Rodney	Oct. 13-14
Gray	Walters' Falls	Sept. 30-Oct. 1
Grey	Durham	Sept. 23-24
Grimsby	Smithville	Oct. 6-7
Haldimand	Cayuga	Sept. 30-Oct. 1
Hamilton	Hamilton	Sept. 22-26
Hastings	Belleville	Sept. 23-26
Huron	Goderich	Sept. 15-17
Kent	Chatham	Oct. 1-3
Lanark	Almonte	Sept. 30-Oct. 3
Lincoln	St. Catharine's	Sept. 29-Oct. 1
London	London	Sept. 18-27
Moulton	Dunnville	Oct. 2
Norfolk	Simcoe	Oct. 14-15
Norwich	Norwich	Oct. 1-2
Ontario	Whitney	Sept. 23-25
Ontario	Cannington	Sept. 26-27
Perth	Stratford	Oct. 2-3
Peterboro	Peterboro	Sept. 24-26
Prince Edward	Pictou	Sept. 9-10
Renfrew	Renfrew	Sept. 25-26
Renfrew	Beachburg	Oct. 2-3
Sherbrooke	Sherbrooke	Sept. 3-5
Victoria	Lindsay	Sept. 30-Oct. 1
Victoria	Fleming	Aug. 27-30
Wellington	Guelph	Sept. 25-27
York	Woodbridge	Oct. 21-22

NOVA SCOTIA.

Yarmouth	Yarmouth	Oct. 9-10

PRINCE EDWARD ISLAND.

Queens	Charlottetown	Oct. 1-3

WALKING CANES.

If you want to get a good outfit of

CANES AND RINGS

at cheapest manufacturers' prices, write for a price list. All goods delivered promptly, C. O. D. by express, on receipt of a deposit with order. Address

Schlichting & Rendsburg.

12 Vesey St., New York.

NOW READY.

Harris's Insects Injurious to Vegetation,
Colored Plate Edition, - - - - - $6.50.
Plain Edition, - - - - - - - $4.00.

Yielding to the pressure of demand we have concluded to issue a limited edition of this, the most valuable work on insects ever published.

ORANGE JUDD COMPANY,
52 & 54 Lafayette Place, New York.

Agricultural Reports.

UNITED STATES DEPARTMENT OF AGRICULTURE. Farmers' Bulletin, No. 2, pages 16. The experiments teach among other things that it is very important to select good cows for the dairy and get rid of the poor ones. Also that the value of the manure determines in some localities the profitableness of dairying. Fibrin, that is a substance that may form a network of minute threads, has been discovered as a constituent of milk, and the creaming of milk is helped by anything that retards the formation of this fibrin. Contact with rough surfaces, exposure to air and agitation favor it, but is retarded by heat, cold and certain chemicals. Therefore, set milk quickly after milking in clean, smooth metallic vessels in cold water. Bacteria, that is minute germs, collect in milk exposed to air and breed rapidly, causing it to sour and curdle. They collect in the milk pans if not properly scalded. With cream the matter is quite different, for the bacteria ripens it and prepares it for the churn. The bacteria breaks up the fat globules so that by agitation the butter "comes." Cream, therefore, needs to be kept under the opposite conditions than those for the rising of the cream from the milk. A number of stations have been investigating the ensilage question. For construction, wood seems to be the best and less expensive than stone or bricks. The dairy cow readily eats the ensilage and does well upon it. Corn silage is not a complete ration, but should have hay, grain, oil cake, cotton-seed meal or some other nitrogenous material fed with it. Corn is the best crop for silage, but should be planted early. Put both stalks and ears into the pit but previously cut fine. Many chemical changes take place in the silo, the fermentation being due to the minute organisms called bacteria and yeast. The former cause the formation of acids and the heating, while the yeasts develop the alcohol sometimes present. "Sweet silage" has only a small amount of acids. Alfalfa is a valuable forage plant that under favorable conditions lives for many years. It is especially adapted to dry climates and withstands drought better than clover, which it much resembles. It grows rapidly and makes several heavy cuts in a single season, and when properly cured is an excellent hay. Alfalfa, or lucern more properly, is worthy of trial by many farmers who are seeking a superior forage plant.

New Jersey Horticulture.

The fifteenth anniversary meeting of the New Jersey State Horticultural Society will be held in the Agricultural College and Experiment Station buildings at New Brunswick, on Monday, September 22. Arrangements are being made for a grand exhibition of flowers, fruits, and vegetables, and an interesting programme is being prepared. All persons interested in horticulture are invited to attend.

A Household Necessity.—I think the AMERICAN AGRICULTURIST the best paper of its class published in the United States, and I do not expect to be ever without it. It has become quite a household necessity.
J. E. SHOFFNER. Shelbyville, Tenn.

WANTED.

Good agents to sell Doctor Doty's Valuable Invention, **THE IDEAL HORSE & CATTLE INJECTOR,** for administering medicine to animals (either drench or pill). Patented June 24, 1890. An invaluable instrument to Veterinary Surgeons, Livery Stable Keepers, Farmers and all Horse and Cattle owners. State and county rights for sale. For particulars address or apply to
DOTY, KEARSING & CO.,
614 River St., Paterson, N. J.

CHINESE GOLDEN PHEASANTS—In splendid plumage, domesticated, $25 per pair; Cocks, superb, $12 each; Young, $11 per pair. **JAMES MORRISON,** Mr. Schieffelin's place, Tarrytown, N. Y.

PIGS, *Jersey* **Calves;** *Rough-Coated* **Collies,** *English* **Beagles;** *Standard* **Fowls, Turkeys, Fox hounds. COLLIE PUPS** *cheap.* **56th** *year.* **F. MORRIS, Norway, Pa.**

FREE FOR 20 DAYS from date of this paper. Wishing to introduce our **CRAYON PORTRAITS** and at the same time extend our business and make new customers, we have decided to make this special offer. Send us a picture of yourself or any member of your family, living or dead, and we will make you a **LIFE SIZE CRAYON PORTRAIT FREE OF CHARGE,** provided you exhibit it to your friends as a sample of our work, and use your influence in securing us future orders. Place name and address on back of picture and it will be returned in perfect order. We make any change in picture you wish, not interfering with the likeness. Refer to any Bank in New York. Address all mail to **PACIFIC PORTRAIT HOUSE, Broadway Theatre Bldg, New York.**

IT WILL COST YOU NOTHING TO LOOK!

WHEN YOU SEE THIS ADVERTISEMENT Write to us at once for our new 1890 CATALOGUE. Just Published. The Handsomest Catalogue of Musical Instruments in the World. Specially designed for **CORNISH & CO.** by a renowned artist. *A CHARMING SOUVENIR.* Illustrated in fancy colors by a new process.

The Manufacturers of the world-famed **CORNISH ORGANS and PIANOS** have determined to introduce their matchless instruments in every part of the civilized world where not already sold, and with that end in view, beg leave to submit the following offer—which is the most liberal ever made—for the consideration of the American Public, who always appreciate a genuine bargain and a good thing whenever they see it.

A WONDERFUL OFFER!

We offer you this first-class, brand new, High Grade, Newly Designed **$75.00 PARLOR ORGAN** (altered for Church or Chapel use when desired), the very latest in style and containing our Newly Invented and Patented Stop Action for the astonishingly low price of

$35

Style No. 16, SWEET HOME ORGAN, (*exactly same as this cut*, taken from a photograph), Solid Black Walnut Case, 5 Octaves, 8 Effective Solo Stops, 8 Sets Orchestral Toned Reeds, Double Octave Couplers, New Tone Swell, Grand Organ Swell, all known modern improvements, making a Complete Parlor Organ, specially warranted for 10 yrs.

ORGANS UPON THE INSTALLMENT PLAN

TO SUIT ALL PURCHASERS. When not convenient to pay all cash we are willing to sell on easy monthly installments. An experience in Organ building of a "Quarter of a Century," coupled with ample capital, enables us to make better terms than any other house in America. There are many tempting offers made that are never carried out by irresponsible advertisers, but this old Established and Reliable **CORNISH ORGAN AND PIANO COMPANY** carry out their contracts to the letter. We refer to the **First National Bank** in our city, where we deposit thousands of dollars every day (except Sundays), to any of the Mercantile Agencies, and what is better, to the thousands of happy purchasers all over the world who are using our Organs and Pianos to their complete satisfaction.

☞ **WE WANT EVERY READER OF THIS PAPER TO WRITE TO-DAY** ☜

for our **1890 20 pp.** handsome Lithograph Catalogues, containing much valued information for intending purchasers. Write whether you want to buy just now or not. We Can Save You Money. **WRITE TO-DAY!** Don't ever think of buying elsewhere until you get our Catalogue. This ad. will not appear again. Show it to your neighbor or cut it out. Mention Paper.

ADDRESS TO-DAY

CORNISH & CO. [Old Established and Reliable.] **WASHINGTON, NEW JERSEY.**

THE CANTON STEEL ROOFING CO., Canton, O.
MANUFACTURERS OF
Folded Lock Seam, GENUINE **STEEL ROOFING.**
FIRE-PROOF SHUTTERS.
10 Ft. Seamless Eave Trough.

CORRUGATED IRON,
Crimped Edge Iron Roofing and Siding, Beaded Iron Siding and Ceiling, Water-Proof Sheathing Paper, Roof Paint, Etc.
☞ Send for Catalogue, Price List and Samples.

WIND & WATER
Use the One to get the Other.
WINDMILL has multiplying ball governor, revolving mast, double bearing shaft—is powerful and durable.
NEW CHAMPION FORCE PUMP
Has vacuum and air chambers, brass cylinders and brass valve seats; works easy; suited to deep or shallow, drilled or dug wells. Steady stream with hose for sprinkling lawns, washing buggies, etc.
Send for book of information FREE.
ENTERPRISE CO., SANDWICH, ILLINOIS.
Continuous Flow.

A SOLID STEEL FENCE!
This Is Not Wire

MADE OF
EXPANDED METAL
CUT FROM STEEL PLATES. SOMETHING NEW.
FOR RESIDENCES, CHURCHES, CEMETERIES, FARMS GARDENS Gates, Arbors, Window Guards, Trellises, Fire-proof PLASTERING LATH, DOOR MATS, &c. Write for Illustrated Catalogue; mailed free
CENTRAL EXPANDED METAL CO
116 Water St., Pittsburgh, Pa.
Hardware Men keep it. Give name of this paper

FREE TO ALL.
Send your address immediately, on postal card, for our 80-page elegantly Illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.
ORANGE JUDD CO., 52 & 54 Lafayette Place, New York.

After a sea diet, to prevent boils and assist acclimation, use Ayer's Sarsaparilla.

DO YOU WANT TO SAVE MONEY? See "Murray," page 487.

☞ **750,000 ACRES OF MOBILE & OHIO RAILROAD LANDS!**

750,000 ACRES OF U. S. GOVERNMENT LANDS! ☜

The former for sale in tracts to suit Purchasers. The latter open to Homestead entry or Pre-emption.

GO SOUTH, YOUNG MAN!

WHY GO WEST to encounter Blizzards, Cyclones, Droughts, extreme heat in Summer and extreme cold in Winter, when you can with less expense and greater facility reach the **SOUTH** and locate in the States of Mississippi and **ALABAMA**, where cheap lands, good health, good water and abundant rainfall, a mild climate (Blizzards, Cyclones and Sunstrokes being equally unknown), good markets for your products and unsurpassed shipping facilities are the inducements offered. On September 8th and 23d and October 14th, 1890, the *Mobile & Ohio Railroad Company* will place on sale at St. Louis, Mo., *Round Trip* Home seekers tickets to all points on the line of the road south of Jackson, Tenn., at *One fare for the round trip*. Good to return within 30 days after date of sale, with privilege of stopping off at pleasure, going and returning, within final limit of ticket.

For further information in regard to rates, address G. W. King, Gen. Pass. Agent, Mobile, Ala., or J. N. Eberle, Land and Immigration Agent, No. 423 Chestnut St. Louis, Mo. For information in regard to lands, address the

Alabama Land and Development Co., or Henry Fonde, Prest., Mobile, Ala.

Circulars, Maps, Pamphlets, and full information mailed free.

LOVELY WINTER FLOWERS

SCILLA CLUSI, a grand winter flower producing enormous clusters of bloom two to three feet in circumference. They are of lovely light and dark blue colors and borne in such marvelous clusters that it makes a plant of wonderful and striking beauty. The bulbs are very large and strong, and should be planted in a five or six inch pot and are absolutely sure to bloom freely during winter, and the great heads of bloom keep perfect for weeks. Freezing does not harm it, and bulbs can also be planted in the garden this fall for blooming in early spring like Tulips. Try it, either for the house or garden. It is sure to bloom and create a sensation, there being nothing among winter flowers which will so astonish and please all beholders. Price of extra large Bulbs, sent at once by mail, postpaid, 20 cents each; 3 for 50 cents; 7 for $1.00. Also

15 Double and Single Tulips, mixed....50c
6 Double and Single Hyacinths, mixed.50c
5 Named Lilies, including Bermuda Easter Lily.....50c
25 Crocus, fine mixed sorts.....25c

Our "Jewel" Collection, 25 Lovely Winter Blooming Bulbs, all named for only 50c postpaid.

SPECIAL OFFER For only $2.00 we will mail everything offered—Scilla, Tulips, Hyacinths, Lilies, Crocus and Jewel Collection, in all 77 Elegant Bulbs

CATALOGUE FREE. Our Large Illustrated Catalogue of Fall Bulbs and Plants is now ready and will be sent free to all who ask for it. We offer the finest stock of Hyacinths, Tulips, Crocus, Narcissus, Lilies, Ixias, Freesias, Alliums, Oxalis and other bulbs for winter and early spring blooming. Also hardy plants, and rare new plants for winter blooming. ☞ Try our winter blooming Orange, Morning Glories, Black Calla, Orchid, etc. We also offer many new and rare fruits. Write at once; these offers may not appear again. Address

JOHN LEWIS CHILDS, FLORAL PARK, Queens Co., N. Y.

Investors should get information about First Mortgage investments (land and railway bonds) paying **6% TO 8%**

TWENTY YEARS' EXPERIENCE.

Have invested $15,549,923
Principal and Interest paid on the day when due $12,107,576

AGENTS WANTED upon liberal commission.
J. B. WATKINS LAND MORTGAGE CO.
319 BROADWAY, NEW YORK.

FARMING THAT PAYS

The offer by Timothy Paige, Esq., of his celebrated Fresno and Tulare County lands in California is worthy of investigation by agriculturists. Twenty acres of this exceptional fruit land will yield an income not generally obtainable from ten times that area of land further East.

10 to 5,000 acre tracts, with perpetual water rights, upon easy terms.

Maps and all particulars of Morris & Ganse, 94 Washington Street, Chicago.

MORRIS & GANSE,
EDWARD C. KEMBLE,
Solicitors for Timothy Paige, Esq.

MONTANA RANCH FOR SALE.

We have the finest ranch in Montana, containing about 3,000 acres, **splendidly located.** Exclusively controlling the best stock range (150 square miles) in the state, with water rights, &c., (**plenty of water** all the year); has R. R. station on the grounds and is **near the large cities.** For sale on **liberal and easy terms.** There are about 1,000 head of cattle and 100 horses on the ranch which can be purchased if desired. For full particulars, address

ARMITAGE & PIATT,
Real Estate, Mines and Investments,
HELENA, MONTANA.
☞ Best references furnished.

FOR SALE—A farm of 1000 acres in the Piedmont section of South Carolina. It is well established as a Stock and Dairy Farm with Cotton as a secondary product; railway station at place, well watered, productive and healthy. Apply to

JOHNSON HAGOOD, Barnwell, South Carolina.

IDAHO IS ADMITTED

To the Union of States.

Boise City is its permanent capital, established by the constitution. A city of orchards and gardens, surrounded by beautiful farms; backed by a range of mountains full of trout streams and covered with fragrant pines. Its business growing in every direction. Free government land. Come and see, or send for illustrated pamphlets to

BOARD OF TRADE, Boise City, Idaho.

Improve your home with our **ATTRACTIVE WALL PAPER**

Remarkably low prices. Enormous assortment of styles. Honorable treatment. We can refer to hundreds of well-pleased customers in every section of the U.S. Our prices range from *excellent* **Lustre** papers at **6c.** a roll to *elegant* **Iridescent Embossed Golds at 35c.** For 8c. postage will send to any address, samples with borders to match.

A. L. DIAMENT & CO., 1206 Market St., Philadelphia, Pa.

NOW LOOK AT THIS!

A postal card sent to **T. McFARLANE,** Iowa City, Ia., will bring to you price and description of a MODEL FARM AND COUNTRY HOME, healthful, beautiful, productive and rare in all that goes to make an earthly paradise.

SHORT-HAND SELF TAUGHT Send for Catalog of Books and helps for self-instruction

by **BENN PITMAN and JEROME B. HOWARD,** to
THE PHONOGRAPHIC INSTITUTE, CINCINNATI, OHIO.

HOLSTEIN FRIESIAN BULL—Sir Ryland Artis, descendant of Clothilda and Netherland Prince, registered; a particularly beautiful animal fifteen months old, for sale. **H. R. SPENCER,** Long Branch, New Jersey.

New York College of Veterinary Surgeons.

Lectures will begin October 1, 1890. For circular address **SECRETARY,** 332 E. 27th St., New York City.

"MAGIC LANTERNS WANTED AND FOR SALE OR EXCHANGE HARBACH & CO., 809 Filbert St. Phila. Pa.

FALL 1890.

Those who wish to procure Advance Styles in Dry Goods for the Fall Season should order samples early.

Many of the leading lines of Silks, Dress Goods, Laces, and Trimmings are now arriving, and cannot be duplicated when once sold.

We endeavor fill orders for samples or for goods the day they are received.

James McCreery & Co.,
BROADWAY AND 11TH STREET,
NEW YORK.

TO KEEP IT SWEET **CIDER** or prevent *Secondary* FERMENTATION.

USE IMPROVED

PRESERVING POWDER.

It does not impair the taste or flavor, it is thoroughly reliable and *absolutely harmless to the human system.*

SEND 35c for a sample, forwarded free; sufficient for 40 gallons. One pound, sufficient for 8 bbls., $1.50, receiver to pay charges, or $1.80 by mail, prepaid. Price lower in larger quantities.

W. ZINSSER & CO., 197 William St., New York.

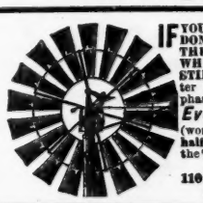
Grind your own Feed and SAVE MONEY.

STAR FEED GRINDER

With or without Tumbling Rod attachment, for running Corn Shellers, Cutter, &c.

Grinds 12 to 25 Bushels per hour

of Ear Corn, dry or damp, Chop Feed, and all small grain, fine or coarse. Can be run by steam power, if desired. ☞ Also full line of **Shellers, Cutters, Broadcast Seeders,** &c. For prices and terms, address **STAR MANUFACTURING CO.**
New Lexington, Ohio.



IF YOU WANT "THE TOWER YOU DON'T HAVE TO CLIMB, AND THE WIND-MILL THAT RUNS WHEN ALL OTHERS STAND STILL," send for our printed matter showing every conceivable phase of wind-mill work. Our *Everlasting Steel Wheel* (work considered) **costs only one-half** what a wooden one does, while the **Tilting Tower is not expensive.**

AERMOTOR CO.
110 and 112 S. Jefferson Street,
Chicago, Ill., U. S. A.

THE PERKINS' Wind Mill

is the Strongest and Best Self-Regulating Wind Mill made. Full instructions for erecting sent with the first mill. **All Wind Mills warranted.** For Circulars and Prices address

The Perkins' Wind Mill & Ax Co.
Agents wanted. **Mishawaka, Ind.**

EXCELSIOR Medical College qualifies in essentials in all branches and in advanced methods. Address Dr. Booth, Springfield, Mass.

Ayer's Sarsaparilla, highly concentrated, is the most economical blood purifier that can be used.

Contents of This Number.

Agricultural Reports....494
Amoor Yellow-Wood....481
Animal Ailments....484
Apple Orchards, Fertilizing....451
Barley Crop, The....464
Basket Items....480
Blight in Fruit Trees....480
BOYS AND GIRLS:
A Rag of Linen....3 *Illustrations*..472
An Insect that is Bought and Sold....473
Girls in the Water....474
Curiosities of Microscopic Writing....474
Another Watch for Somebody....474
An Old-Fashioned Corn Hunt....*Illustrated*..475
A Nut-Cracking Bird....475
California Mountains, Winter in the....476
Cattle, Hereford....*Illustrated*..461
Cheese, American, To Make Profitable....451
Chrysanthemums, Mildew on....480
Cleaning Solution....480
Corn Fodder, Save the....*Illustrated*..458
Cotton-Seed, Roasted....451
Cow, Dairy, The Points of a....462
Cross-Pollination, Immediate Effects of upon Fruits..450
Dixie, Down in....477
Egg-Farm, A City....7 *Illustrations*..457
Eggs for Incubators....456
Farm Gate, A Strong....*Illustrated*..456
Farmer, Shiftless Tricks for a....454
Farming in Foreign Lands....479
Farming, The Bright Side of....482
Feeding Trough for Calves....*Illustrated*..458
Florida, Climate in....476
Flowers, Fragrant, at Christmas....467
Forsythias....480
From Far and Near....476
Fruit-Holders, Have Clean....456
Garden Fence, Blooming, A....466
Grain, Holding for a Rise....453
Grape-Rot....480
Grave Question, A....482
Heifers, Raising....481
HOUSEHOLD:
It All Depended....*Illustrated*..468
Favorite Lace....*Illustrated*..469
Home Hints and Suggestions....*Illustrated*..469
Handkerchief Sachet....*Illustrated*..469
Aunt Cora's Lace....469
Pickles Sweet and Pickles Sour....470
Odds and Ends....470
Items of Fashion....470
Some Pretty Trifles....471
Crochet Point Lace....*Illustrated*..471
Seasonable Recipes....471
Ice-House, How to Build an....480
Indians, Pueblo, Among the....*Illustrated*..477
Insects and Colors....480
Iowa, The Agricultural Situation in....476
Iris, The....*Illustrated*..466
Jigger, The....481
Kansas, A Family Garden in....476
Live-Stock in California....*Illustrated*..463
Mangers....462
Manure, How to Apply Profitably....460
Manure Pile, How to Increase the....462
Maples Dying....481
Mathematical Problem, A....491
Matters of Business....486
Milk, Care of....462
Nitrogen, Apply to Get Starch....459
Nitrogen—Its Cheapest Source....460
Oak-Pruner....481
Ozark Mountains, In the....477
Paint, Removing....481
Peach Crop, Delaware, Failure of the....476
Peanuts, Their Growth and Culture....3 *Illustrations*..465
Piggery, An Improved....2 *Illustrations*..458
Poultry Show, Grand, in New York City....481
Plowing, Fall, for Oats and Barley....450
Pork, Growing for Bacon....459
Pork, Making for Profit....458
Potato-Growing in Cuba....477
Poultry, Pure-Bred, on the Farm....456
Recent Publications....488
Rosa, Rugosa, The Original Home of....466
Rose Leaf-Hopper, The....2 *Illustrations*..465
Sanfain....481
Science in Farming....478
Seed-Clover, Handling....460
Shetland Ponies....5 *Illustrations*..452
Spaniels, Cocker....*Illustrated*..459
Squeezer, Home-Made....456
Steer, Killing a....480
Streams, Small, Cleaning Out....451
Sugar-Cane Culture in Louisiana—II....*Illustrated*..455
Sweet Peas....481
Sweet Potatoes, Black Rot in....480
Throw an Animal, How to....*Illustrated*..456
Turnips, To Raise Cheaply....464
Wagon Tires, Old, New Use for....*Illustrated*..456
Watermelon Industry, The....*Frontispiece*..450
Weeds, Ways of....458
What the Season Has Taught....454
Wheat, Influence of Season on the Produce of....464
Vacation, An Autumn....482

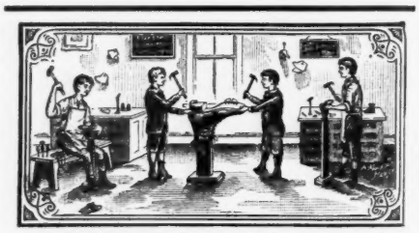
ENSILAGE AND FODDER CUTTERS

of all sizes, the **fastest cutting, strongest, most durable** and **best** ever built, including **Carriers,** both straight and angle, of any length required. For free pamphlet showing **"Why Ensilage Pays,"** and for free descriptive and illustrated catalogue of the **best Tread-powers, Lever-powers, Threshers, Clover-hullers, Wood Saw-machines, Feed-mills** and **Fanning-mills,** send to the old and reliable Empire Agricultural Works, over 30 years under same management.

MINARD HARDER, Proprietor, Cobleskill, N. Y.

MILK PRESERVATIVE!

Milkmen and Dairymen can keep milk and cream fresh a week *without using ice.* Thoroughly healthful. No expense. Send for sample and circular. THE PRESERVALINE MFG. CO., 23 Cedar street, N. Y.

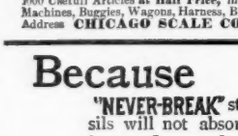


FISKE'S AMATEUR'S BOOT AND SHOE REPAIRING JACK will repair any shoe from a child's size 10 to a man's 11. Boys, repair your own shoes at home, also your father's, mother's, sisters' brothers' and cousins' and aunts' (if they will pay for it). Any boy from 12 to 15 years old can do it with our Jack and outfit; price, $8.25, which consists of one Repairing Jack, $2.50; one doz. pairs white oak Half Soles, $1.75; one doz. pairs Heel Lifts, 60c.; one pat. Peg Awl Haft, 10c.; half doz. Peg Awls, 5c.; three sewing Awls and Handles, 15c.; one Ball Thread, 10c.; one Box Ink Powder, 10c.; three qts. Pegs, 15c.; one lb. wire Clinch Nails, 15c.; one lb. Heel Nails, 5c.; one lb. steel Nails, 10c.; one pair Pinchers, 50c.; one Hammer, 25c.; one Shoe Knife, 20c.; one Emery Knife Sharpener, 25c.; one Burnisher, 35c.; fifty pairs Star Plates, 50c.; half doz. Shoemakers' Needles, 5c.; one Stick Heel Ball, 10c.; one Bottle Leather Cement, 10c.; one Bottle Rubber Cement, 15c.; one Rasp and Wax, 40c. These Half Soles and Heels are all cut out with dies, ready to put on, and are of the best white oak leather, all sizes. The stock included in the outfit will make from $12.00 to $15.00 worth of work, and you have the Jack and Tools left for more work. Price, $8.25. Will send this entire outfit by Express, C. O. D., subject to your approval, or by Freight, upon receipt of the price, $8.25. Full instructions go with every outfit. We also manufacture Fiske's Oil and Rubber Patent Leather Polish. A sample bottle goes with every outfit. Price, $1.25 per doz. The outfit weighs 50 lbs. If you order by Express, C. O. D., send $2.00 on account. We pay charges on money returned. The tools and Stock in this outfit are of the finest quality and the same as we sell our regular trade.

Correspondence solicited.

J. D. FISKE & CO.,
Wholesale Dealers in Leather and Findings,
278 Asylum St., Hartford, Conn.

THIS CHAMPION ROAD WAGON $30.
A Light Delivery, Market or Business Wagon.



2 Seated Family Wagon, $36
Best Road Cart Made, 15
A Good Strong Road Cart, 10
Top Buggy with Shafts, 55
4000 lb. Wagon Scale, 40
900 lb. Platform Scale, 15
A Neat Buggy Harness, 7
4 lb. Family or Store Scale, 2

1000 Useful Articles at **Half Price,** include Scales, Safes, Sewing Machines, Buggies, Wagons, Harness, Blacksmiths Tools. **List Free.** Address **CHICAGO SCALE CO., CHICAGO, ILLS.**

Because

"NEVER-BREAK" steel cooking utensils will not absorb grease, will not impart flavor of previously cooked food, will not burn before cooking, will not scale or crack, will not warp, will **"NEVER-BREAK"** and because they are the nicest, neatest, cleanest cooking utensils made, *you* ought to have them. Send for illustrated circular.

THE BRONSON SUPPLY CO., Cleveland, O.

Davis STUMP Puller Lifts 20 to 50 Tons.
Worked by 2 men. 5 sizes.
Price, $35 to $70.
Circulars Free. Sent on **Three Days Trial.**
H. L. Bennett, Westerville, O.

THE GREAT AMERICAN TEA COMPANY

CHANCE FOR ALL

To Enjoy a Cup of Perfect Tea. A TRIAL ORDER of 3½ pounds of Fine Tea sent by mail on receipt of $2.00. Be particular and state what kind of Tea you want. Greatest inducement ever offered to get orders for our celebrated Teas, Coffees and Baking Powder. For full particulars address

THE GREAT AMERICAN TEA CO.,
P. O. Box 289. 31 and 33 Vesey St., New York.

Fibrous Roofing Cement.

Stops **any** leak in **any** roof by **any** body in a **few** minutes, for a **few** cents. Samples free.

A. J. JEWETT, Steubenville, Ohio.

BOOKS. FARMING WITH GREEN MANURES. The Fourth Edition now ready. Price, bound in paper, 65 cents; in cloth $1. Will be sent, for cash, free, of postage. Address

DR HARLAN, Wilmington, Del.

WASHINGTON What Uncle Sam and Aunt Columbia think, etc., of and Seattle its Metropolis. Address Eshelman, Llewellyn & Co., Seattle, Wash.

Splendid Location—Good Salesmen—Quick Returns.
WARREN HARPER & BRO.,
Fruit & Produce Commission Merchants,
110 DOCK STREET, PHILADELPHIA.
References: Sixth Nat'l Bank and the trade generally.
Consignments solicited.

$7 AGENTS WANTED **PICKET FENCE MACHINE.**
No twisting of main wires, no sag to fence; pickets easily removed and replaced. Write for prices and circular to
LANSING WHEELBARROW CO., Lansing, Michigan.

The **GRANGER** family fruit and vegetable

EVAPORATORS.
$3.50, $6.00 and $10.
Send for circular. Eastern Manufact'g Co., 257 S. Fifth St., Phila.

AMERICAN AGRICULTURIST.

—o—

Terms of Subscription in the United States and British Provinces.

The AMERICAN AGRICULTURIST is published monthly and is mailed in time to reach subscribers on or before the first of each month.

Single subscriptions $1.50 per year or 75 cents for six months. Clubs of five or more, $1.00 per year, or 50 cents for six months.

A FREE copy for every club of five for either term.

Subscriptions payable in advance.

Remit by postal note, express or post-office money order, registered letter, check or draft; postage stamps accepted for fractional parts of a dollar.

The date to which subscription is paid is indicated by the number on the printed label bearing the subscriber's name which is attached to the wrapper enclosing the magazine. If the number on your label is **524** it indicates that your subscription is paid up to and expires with this September number, **525** with the October number, and so on. The numbers of each issue will be found on the frontispiece.

Responsible subscribers will continue to receive this magazine until the publishers are notified by letter to discontinue, when all arrearages must be paid.

New subscriptions can commence at any time during the year and with any number desired.

Canvassers **wanted** in every town to solicit subscriptions. Terms sent on application.

Rates to Foreign Countries.

The yearly subscription of the AMERICAN AGRICULTURIST in shillings and pence to subscribers in foreign countries is as follows:

	s.	d.	U. S. cur.
Africa except Egypt, Liberia and Congo	10	3	$2.46
China	11	3	2.70
Madagascar	12	3	2.94
St. Helena	10	3	2.46
Transvaal	11	3	2.70
New South Wales	7	3	1.74
Victoria	7	3	1.74
Queensland	7	3	1.74
New Zealand	7	3	1.74
Tasmania	7	3	1.74

Countries in the Universal Postal Union, including Newfoundland, Egypt, Liberia, Congo, and all others not mentioned above, 7s 9d; United States currency, $1.86.

In clubs of five or more a discount of 50 cents, or two shillings one penny, is allowed on each subscription.

Remit by post-office money order, payable to AMERICAN AGRICULTURIST, at New York General Post-Office, and inclose the money order with your letter to avoid delay and possible loss. Drafts on New York are acceptable in the absence of any other form of remittance.

Advertising Rates.

Ordinary Pages, **$1.00** per line (agate), each insertion.
Last Page, and Third Cover Page, **$1.25** per line.
Second Cover Page, **$1.50** per line.
Page next to Reading and Last Cover Page, **$2.00** per line.
No advertisement taken for less than **$3.00** each insertion. Fourteen agate lines make one inch.

—o—

Direct all Business Communications pertaining to Subscriptions and Advertising to

AMERICAN AGRICULTURIST,
52 and 54 Lafayette Place, New York.